LINOLEUM BLOCK PRINTING

ERNEST W. WATSON

LIBRARY
THE
YOUNG MEN'S
CHRISTIAN
ASSOCIATION
COLLEGE
CHICAGO · LAKE GENEVA

LIBRARY
THE MASTER'S COLLEGE
NEWHALL CALIFORNIA

LINOLEUM BLOCK PRINTING

PRACTICAL INSTRUCTION FOR STUDENT AND ARTIST IN THE TECHNIQUE OF BLOCK PRINTING WITH LINOLEUM

BY

ERNEST W. WATSON

LIBRARY
THE MASTER'S COLLEGE
NEWHALL CALIFORNIA

PUBLISHED BY
MILTON BRADLEY COMPANY
SPRINGFIELD, MASS.

LIBRARY
THE MASTER'S COLLEGE
NEWHALL CALIFORNIA

GEORGE WILLIAMS COLLEGE
LIBRARY
5315 DREXEL AVENUE
CHICAGO, ILL.

761.3
W332L

COPYRIGHT 1929
BY
MILTON BRADLEY COMPANY
SPRINGFIELD, MASS.

760
W332
14186

PRINTED IN U.S.A.

3.00
16

THIS BOOK
IS DEDICATED TO

EVA AULD WATSON

WHO IS RESPONSIBLE
FOR MUCH WHICH APPEARS
ON ITS PAGES

ACKNOWLEDGMENT

IS GRATEFULLY MADE TO THOSE WHO GENEROUSLY ALLOWED THE AUTHOR TO USE THEIR LINOLEUM CUTS AS ILLUSTRATIONS FOR THIS BOOK

PREFACE
To the Teacher

THE discovery that it is possible to make "woodcuts" with linoleum as a substitute for the traditional wood block has placed in the hands of the student one of the most fascinating mediums for the study of art and design. That teachers have realized the opportunity of the linoleum-cut is indicated by the widespread enthusiasm for it in the public schools. The printing of patterns upon textiles, which had formerly been done in a small way with laborious wood blocks, is now practiced in nearly every schoolroom with ease, thanks to this new material. Pictorial block prints, entirely impractical in the schools before the coming of linoleum, are now delighting the hearts of multitudes of juvenile artists who at last are able to feel the very thrill which inspired the primitive illustrators in their first experiments with woodcuts five hundred years ago in Europe.

Indeed, it is that thrill which makes block printing so popular and which assures us that it is not a fad but one of the most effective means for teaching art. It is fun to make prints. Give the beginner a few blocks which have already been engraved and watch his enjoyment as he rolls the ink upon them, puts them under the press, and eagerly inspects the prints. How much more fascinated will he be when he makes his first proof of the block which he himself has designed!

The aim of this book is to give practical instruction in the art of linoleum block printing. The methods demonstrated have been developed by the author during many years of professional print making and through the presentation of this subject to the teacher training classes at Pratt Institute. It is the author's hope that the book will be an incentive to the more general practice of this valuable craft in the schools, and that a greater number of boys and girls will be heard to exclaim as they pull their first proofs, "Oh, boy, look at this one!"

Digitized by the Internet Archive
in 2024

https://archive.org/details/linoleumblockpri0000erne

PREFACE
To the Student and Artist

PICTURES have been printed from woodcuts for many centuries. The use of linoleum for this purpose is of recent origin, this material (of suitable quality for making relief blocks) having been available for scarcely more than a score of years.

During this time interest in linoleum-cuts has been practically confined to teachers who have seen great educational possibilities in the new medium, and to amateurs who like to print their own Christmas cards. To these teachers and amateur block printers the linoleum-cut has been considered a substitute for the more respected woodcut, which is ill-adapted to casual experiments in print making.

However, a few artists have taken the linoleum block seriously and have considered it a worthy medium for the expression of their ideas. These artists, it should be noted, do not regard linoleum as an easy substitute for wood. As a matter of fact, the artist finds linoleum neither easier nor harder than wood; he thinks of it as neither inferior nor superior to wood, but recognizes it as an entirely different medium for the making of a print.

Experiments with both wood and linoleum will convince any artist that each offers a distinctive technique. Wood will produce effects which are impossible in the softer material. Linoleum offers the artist an equally individual treatment beyond the reach of the woodcut. Let each decide which is better adapted to his own manner of expression.

Interest in prints is becoming widespread. A good color print or etching can be purchased for as little as ten dollars. It is thus well within the means of hosts of picture lovers to possess original works of art. Smaller living quarters in city apartments, due to congestion of population and to the servant problem, have created a demand for small pictures. While the etching at present enjoys an envious popularity, the modern demand for color appears as an encouragement to those who prefer making color prints.

The artist who aspires to become a professional print maker will find in this book the elements of the technique and a suggestion of its possibilities in professional print making. The discussions of school printing problems, which are necessarily prominent in the various chapters, should not give the unwarranted inference that linoleum printing is an art only for amateurs.

CONTENTS

Page

PREFACE To the Teacher V

PREFACE To the Student and Artist VII

CHAPTERS Page

I. COMPARATIVE METHODS OF PRINT MAKING .. 1

II. LINOLEUM BLOCKS AND THEIR PREPARATION FOR PRINTING 2

III. ENGRAVING AND ENGRAVING TOOLS 4

IV. COLORS AND THEIR PREPARATION FOR PRINTING 13

V. THE INK SLAB 15

VI. THE PRESS 19

VII. THE ROLLER OR "BRAYER" 23

VIII. PRINTING WITHOUT A PRESS 25

IX. TRANSFERRING THE DESIGN TO THE BLOCK .. 28

X. WITH BRUSH AND GOUGE Black-line and White-line 30

XI. FURTHER EXPERIMENTS IN WHITE-LINE 38

XII. REGISTRY 42

XIII. OFFSETTING 44

XIV. FLAT COLOR PRINTING 53

XV. COLOR GRADATIONS AND BLENDINGS 60

XVI. BLOCK PAINTING 65

XVII. THE TECHNIQUE OF BLOCK PRINTING 69

CHAPTER I

COMPARATIVE METHODS OF PRINT MAKING

THIS book demonstrates a modern method of making prints which differs in essentials from traditional processes. Linoleum blocks and oil colors are the basis of a technique which the author believes is best adapted to school conditions. But a word should be said about other processes in order that the beginner will not be a stranger to block prints made with different materials and tools. Indeed, if the student is not inspired by his own experiments in linoleum printing to learn to know and enjoy prints of every kind, he will lose half the reward which his adventure in the graphic arts has in store for him.

European woodcuts were—after the invention of the printing press—printed with oil color. This was natural, as woodcuts from the first served as illustrations for books. Then, as now, oil was the mixing medium in printer's ink. The ink was applied to the blocks at first with a dauber and in later years with a roller or brayer. The imprint was made by pressure in a screw press, or sometimes by rubbing the back of the paper with a burnisher as it lay upon the block, the method always employed in Japan.

Japanese prints were made with water color applied with brushes to wood blocks. The color was mixed with a paste to prevent its drying upon the block before the imprint could be made. The streaks left by the brush are usually quite evident in the print and give a charming effect. The Japanese print was a three-man product; artist, block-cutter and printer co-operated in creating prints which are superb masterpieces of the block printing art. The maker of color-prints today must be artist, block-cutter and printer, a handicap which cannot be denied in competing with the matchless art of old Japan.

Most modern print makers have adopted the Japanese method. There are, however, a few who print with oil colors from both wood and linoleum blocks. It would seem unnatural to use water color on linoleum as this material has considerable oil in it which of course repels water color. No doubt the surface could be treated chemically to remove this obstacle. At any rate the Japanese method is evidently too difficult for public school work.

CHAPTER II

LINOLEUM BLOCKS AND THEIR PREPARATION FOR PRINTING

LINOLEUM suitable for block printing is commonly called Battleship Linoleum. It may be purchased at nearly all shops which handle floor coverings and is usually available in thicknesses of one-eighth, three-sixteenths and one-quarter inch. Cork linoleum is an entirely different material and is not suitable for block printing. The surface textures vary considerably; the smoothest surface obtainable is best suited for the purpose. Even this may require smoothing with fine sandpaper if the design is delicate and carries much detail. Furthermore, success in offsetting (an important process involved in block making) demands that the block be very smooth. Again, a smooth block is printed with less pressure than a rough one requires.

Some linoleum is hard and some quite soft. The hard material naturally is more difficult to cut, yet it is best for fine detail. The softer material cuts very easily and is satisfactory for designs having simple bold masses, such designs as the beginner is likely to employ for his first experiments. In a color print demanding several blocks, the hard linoleum may be used for the blocks carrying the detail and the soft selected for tint-blocks or large areas, such as cloud masses.

If the blocks are designed for printing in a power press they must be mounted on wood thick enough to make them "type-high"; that is, the combined thickness of wood and linoleum must be about seven-eighths of an inch. Mounting linoleum on wood is a difficult operation which is best left to those who have the skill and the equipment to do it in a satisfactory manner. Many houses selling school supplies furnish such blocks ready for engraving. When the printing is to be done in a commercial print shop—that is, outside of school or studio—the design *may* be engraved upon an unmounted piece of linoleum and sent to the printer who will have it "blocked" ready for the press. In schools possessing their own power presses the engraving may be done either before or after mounting. An engraved block should be tacked rather than glued to the wood.

The purpose of backing linoleum with wood is to enable the printer to clamp it into his printing press. When blocks are not to be printed on the "job press" the only reasons for mounting the linoleum at all are to

prevent it from curling and to stiffen it for handling. Blocks not exceeding thirty-five square inches need no mounting if three-sixteenths or one-quarter inch linoleum is used. Such blocks will be stiff enough for handling even though the background areas are large, provided of course that they are not cut too deep. Three-sixteenths linoleum seldom curls, though unmounted. One-quarter inch material is likely to curl and is not recommended for general use whether mounted or unmounted. The best mount for linoleum is one-sixteenth inch cardboard. Three-sixteenths inch linoleum backed with cardboard makes an excellent block for any design, large or small. One-eighth inch linoleum may be substituted for small blocks.

Linoleum is sold by the yard, cut from rolls two yards wide. It may be cut into small pieces by means of a knife, saw, or metal shears. A saw is quickly dulled in cutting linoleum; metal shears work quite well; the knife does the neatest job. Place the linoleum on a table with the burlap side down. With a white pencil lay off the required sizes, using a carpenter's iron square for accuracy. Score the lines heavily with a sharp blade—the author uses a safety razor blade—and bend the linoleum back until it breaks along the line. The burlap backing can be severed with a single slash of the blade. Cutting clear through with the knife gives a neater edge than does scoring and breaking. Any burlap lint left on the edge of the cut may be removed by sandpapering.

In mounting, spread the glue thinly upon the burlap back of the linoleum, using a flat stick or a palette knife to distribute it evenly over the surface. After placing the cardboard in contact with glued surface put in a letter press or under a heavy weight, with newspaper below and on top to catch any glue which oozes out. When the glue is dry the edges of the block should be sanded smooth and true, using the square to test the corners.

CHAPTER III

ENGRAVING AND ENGRAVING TOOLS

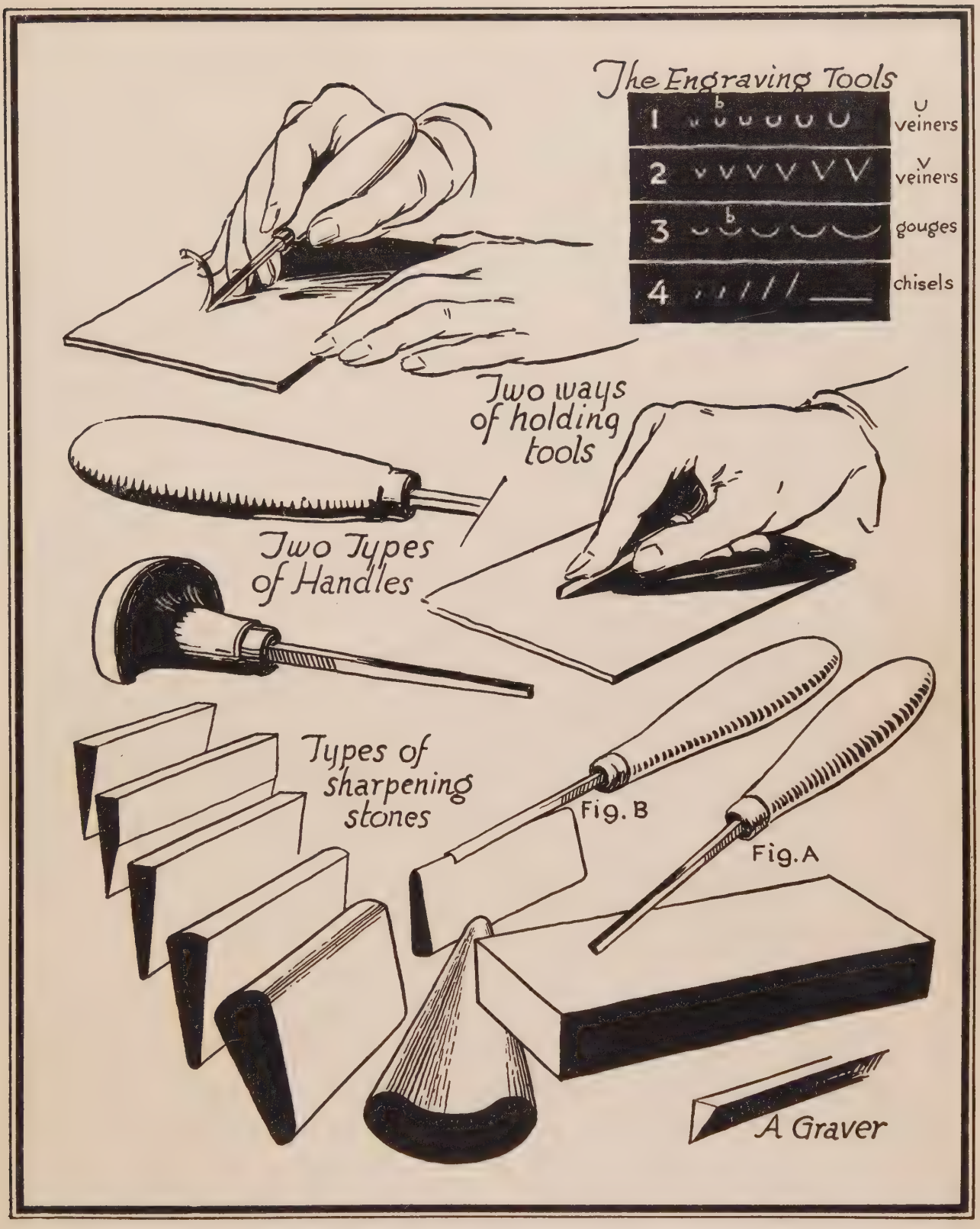
THE terms "woodcut" and "wood-engraving" are often used synonomously by those who are unfamiliar with the development of the art of printing from wood-blocks. Yet they indicate two distinct methods of preparing blocks for printing, methods which are based upon tools differing widely in character and use. Each tool is responsible for a technique which is entirely individual, the woodcut technique and that of the wood-engraving being as unlike as are drawings made with the pen and those done with the brush.

The woodcut is made with a knife upon a plank of wood having a rather firm, close grain. In working upon wood "plank-wise" some of the knife cuts follow the grain while others go against it. A sharp knife is the proper tool to give good clean cuts in all directions on the plank. Cuts are made along each side of the lines, the knife slanting away from the lines—instead of being held vertically—to give them a broad supporting base of wood.

Wood-engraving—a later invention—is done by the graver upon the end grain of a block of wood. The graver (see page 5), once employed exclusively by engravers on metal, is a solid piece of steel, ground off at the end so as to secure sharp U or V shaped cutting edges. The wood-engraver pushes this tool across the end grain block, plowing a furrow which becomes a white line in the print; hence the term "white-line engraving." The graver may be pushed in any direction with equal ease as the end grain of the wood offers no directional influence.

In the cutting of linoleum blocks the wood-cutter's knife may be used with good result. Although the graver is useless on linoleum—it plows a ragged furrow—the "veiner," a tool used by wood-carvers, produces the same effect on linoleum as does the graver on wood. The veiner, therefore, may be considered an excellent substitute for the graver and the use of this tool justifies the term "linoleum-engraving." The white-line engravings on pages 36 and 37 were made with fine veiners and should be studied in this connection.

"Which tool is preferred, the knife or the veiner ?" The query may be answered by another question: "What sort of character is desired in


The Engraving Tools
1
U veiners
2
V veiners
3
gouges
4
chisels
Two ways of holding tools
Two Types of Handles
Types of sharpening stones
Fig. B
Fig. A
A Graver

the print ?" Cutting the block with a knife will lend a certain severity to the work, due to the attitude of deliberation which its use imposes on the artist. The veiner, on the other hand, encourages facility and greater freedom. It is certainly a simpler tool to manage and one which will assure better results in the hands of the beginner.

The tools available for engraving on linoleum, and sold by dealers in school supplies, are illustrated on page 5. They may be classified as follows: U-shaped veiners, V-shaped veiners, gouges and chisels. The student is advised to experiment with all of these types and discover his preferences. The author employs the U-veiners and the gouges only. For elementary work the beginner can get along with two tools, a veiner and a gouge. Veiner b and gouge b might be selected. These two tools were used in engraving the block on page 7. A veiner may be made from a four-inch length of an umbrella rib set in a wood handle. When ground as described below it does fairly good work but of course is far from a first-class tool.

Keeping the tools sharp is important and requires skill. Adequate grinding stones must be at hand. Various types of oil stones are shown on page 5. In sharpening the veiners and gouges the outside of the tool is ground (Fig. A) to a feather edge—use kerosene oil—on the flat side of the stone. The feather edge is removed by the slip stone which fits inside the tool (Fig. B). The inside edge is really not ground. It takes considerable practice to sharpen a tool well, yet sharp tools are the first requisite for good engraving technique. Any carpenter or wood worker should be able to give the needed instruction in sharpening.

The veiners are employed for cutting close to the lines or masses of the design, and may be considered outlining tools (see page 7). Thus the veiner is the tool which really gives character to the engraving, the gouge which removes the areas between veiner cuts merely doing mechanical work and having no influence upon the character of the print. The beginner will be apt to think of the veiner as a mechanical tool as well, since he makes it follow the lines of his design as perfectly as possible. Later he will find himself using the tool with greater freedom, following the design to be sure, but giving character to its contours with the tool, rather than slavishly following an outline drawn upon the block with brush or pencil.

The background should be cut low enough to escape contact with the roller as it passes back and forth over the block. Narrow "valleys"

A LINOLEUM CUT PARTLY ENGRAVED. REPRODUCED EXACT SIZE.
The picture was "offset" from a brush and ink drawing as described in Chapter IX.

SECTION OF AN ENGRAVED BLOCK.

Wide valleys are deeply cut. Narrow valleys cut shallow.

Vertical cuts are bad.

Sloping cuts insure a good, durable block.

should be shallow, broad valleys deeper. It is wise to cut shallow at first, then make a proof from the block. The proof will indicate what further trimming is required.

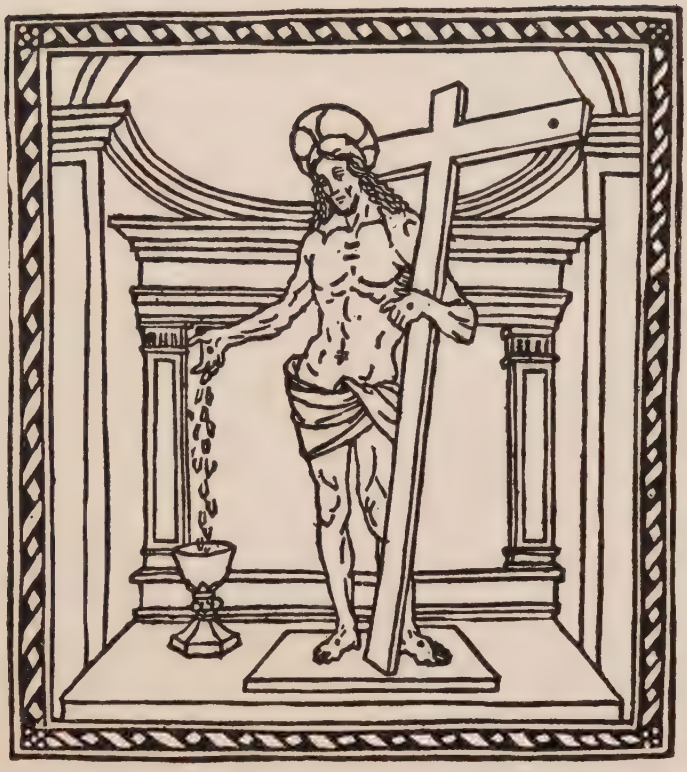
Talcum powder is useful in engraving. Dusted on the block it fills the engraved lines; when the relief areas are wiped clear of powder with the palm of the hand, the appearance of the block gives the effect to be expected in the print itself. This procedure is employed when the engraver wishes to study his work before the block is finished. It is often more convenient than inking the block for the press proof, and gives the desired effect without soiling the block which is still in process of engraving.

Unless the background areas are cut quite deep, the ridges between gouge cuts are certain to pick up ink from the roller and deposit it on the print (see page 10). Sometimes these accidental effects enhance the charm of the print, and one is tempted to let them remain on the block in spite of the purist's complaint that this is contrary to the ideals of craftsmanship and that art should not lean upon accident. But what artist has not been taught much by accidents?

About two-thirds the size of original cut.

A cut by Jean Stewart (exact size), printed originally on blotting paper, showing use of background accidents. The ragged, broken lines of the background gouge ridges can readily be distinguished from the clean lines of the original design.

A FLORENTINE WOODCUT



PIETÀ

Woodcut, in Savonarola's Tractato della Humilita, Florence, about 1500, in the Print Room of the Metropolitan Museum of Art, New York, and reproduced through the courtesy of the Museum.

The decorative border serves a practical as well as ornamental purpose, as it makes the block easier to ink and to print.

CHAPTER IV

COLORS AND THEIR PREPARATION FOR PRINTING

PRINTING inks may be purchased from dealers who supply commercial printers with their colors. They can be bought by the pound in tins or in one-quarter pound tubes if smaller quantities are desired. As the colors are very powerful, a quarter-pound tube will make a large quantity of pigment when diluted with "Mixing White" to bring it to the desired tint. Furthermore the tubes are much more convenient to handle.

Artists' oil colors may be substituted for printers' inks provided printers' Mixing White is used in diluting them. The Mixing White contains litho-varnish, a sticky medium essential to all colors that are to be applied with rollers or brayers. If the colors are to be applied with brushes or daubers—a method sometimes used but not advised—the Mixing White is not required, ordinary artist white oil paint being adequate for mixing purposes. Printers' ink is quite inexpensive and is to be had in a great variety of beautiful colors.

When printers' inks are put out upon the mixing slab they are sometimes too "stiff" for application, particularly if the temperature of the room is low and the slab is cold. To reduce them to the proper consistency a few drops of refined linseed oil (such as artists use) may be added to the pile of color, the color and oil being thoroughly mixed with a palette knife. However, one should guard against the use of too much oil, as an excess of oil in the paint is troublesome in printing. Do not add oil unless it is imperative. In cold weather locate the ink slabs near radiators if possible. Electric heaters can be used, if necessary, to take the chill off the slabs before starting to print.

Artists' oil colors contain more oil than printers' inks, and therefore demand less mixing oil. In fact they have so much oil that unless combined with a fair amount of Mixing White they are hard to apply with the printer's roller. This difficulty is seldom encountered however, as few color schemes call for brilliant, undiluted pigments. Usually a considerable amount of white is needed to reduce the intensity of colors fresh from the tubes. A dark mixture of colors naturally contains less of the sticky Mixing White and is more apt to be troublesome. If "extra

heavy" Mixing White is used this difficulty is reduced to a minimum. In mixing white ink with the colors it is good practice to put the *white* out on the slab *first* and stir the colors into the white with a palette knife until the right hue is secured.

When the pigment has been brought to the right color, separate a little from the pile with the palette knife and "roll it up." "Rolling up" means spreading out a thin film of ink on the slab with the brayer. To do this roll the brayer back and forth in all directions over the color which has been scraped out until a perfectly even film, satin-like in appearance, is spread over an area a bit larger across than the length of the roller. If too much ink has been put out and the "rolled up" patch is too thick, scrape up some with the palette knife and roll up what remains. The beginner will learn the proper consistency after making some trial proofs. If the ink is too thickly rolled out, too much will be applied to the block; the excess will then ooze out when pressure is applied to the block and ridges of ink will be observed upon the print. The excess ink will also fill in fine details of the design. Just enough ink to make a sharp impression is desired and this means a thin rolling up.

Color remaining upon the slab (after printing is over for the day) may be kept fresh for future use in various ways. If the color is to be used again within 24 hours it can be placed upon a pane of glass and submerged in water, or put directly upon the bottom of a pan which can then be filled with water. If left in water much over 24 hours the paint will begin to skin over, as there is of course some air in the water. To hold over for 48 hours or longer leave the paint in neat piles on the slab, or put on a pane of glass if preferred. The paint will then acquire a "skin." After a few days this skin will become quite tough and can be entirely removed by cutting neatly around the base of the pile and cautiously lifting it off. After removing skin, roll it about on the slab; the soft paint which has adhered to the skin will stick to the slab and can thus be saved. Still another preserving method is to transfer the paint from the slab to tins with tight covers. Cut waxed paper the size of the tin and press it down in contact with the color before putting on the can cover. Color can thus be kept fresh for an indefinite period.

CHAPTER V

THE INK SLAB

A SMOOTH white slab of non-absorbent material is needed as a "palette" for the mixing and "rolling up" of colors. Marble makes the ideal slab; it never wears out and it can be kept clean by scouring with cleansing powders or with paint remover. On the other hand it is heavy and is therefore impractical in many schools which, lacking space for a permanent installation, demand portable equipment. Marble is also rather expensive, although slabs from old tables or dressers, which serve admirably, can often be had for the asking or for a small sum. Marble table tops for kitchen tables are available at the big stores.

A white enameled wood surface is a satisfactory substitute for marble. Pastry mixing boards bought at the department store answer very well. The surface should be sanded with fine sandpaper, then given a coat of flat white paint. When thoroughly dry this primary coat should be sanded. An even coat of the best white enamel should next be applied and sanded when it is hard. Two or three coats of enamel with generous sanding between applications will make a splendid slab with reasonably good wearing qualities. The quick drying "brushing lacquers" accomplish the result more speedily and probably are more resistant to the action of the oil in the printing inks as well as the benzine used in cleaning the slab. The inks must never be allowed to dry hard on these enameled wood slabs; paint remover used to soften dried inks will of course affect the enamel as well.

Mixing slabs of window glass are sometimes employed. Enameled iron covers for laundry tubs or kitchen tables are also practical.

The width of the slab (front to back) should be twenty-six inches if possible. This provides six inches for piles of color along the back, ten inches for "rolling up" in front of the piles, and ten inches along the near edge for laying the blocks while they are being inked. (See illustration, page 17.) It is not absolutely necessary to provide space on the slab upon which to lay the blocks while inking—a table near by can be provided for this purpose. The first arrangement is not only more convenient for inking the blocks; there is less cleaning to be done after printing, when the ink is confined to the slab.

The length of the slab depends entirely upon the work to be done. An artist making color prints from several blocks needs at least seven

running feet of slab. For simpler work less space is required. It is safe to allow eight running inches for each color to be put out upon the slab. Thus a six-foot slab will accommodate nine colors.

The height of the slab, or printing table as it may be called, is important. Too low a slab will soon produce a tired or lame back if the artist spends much time at the press. It is best to make the slab as high as is practical. Thirty-four inches is not too high for a tall person. Before setting the slab permanently, careful experiments should precede a decision in this matter.

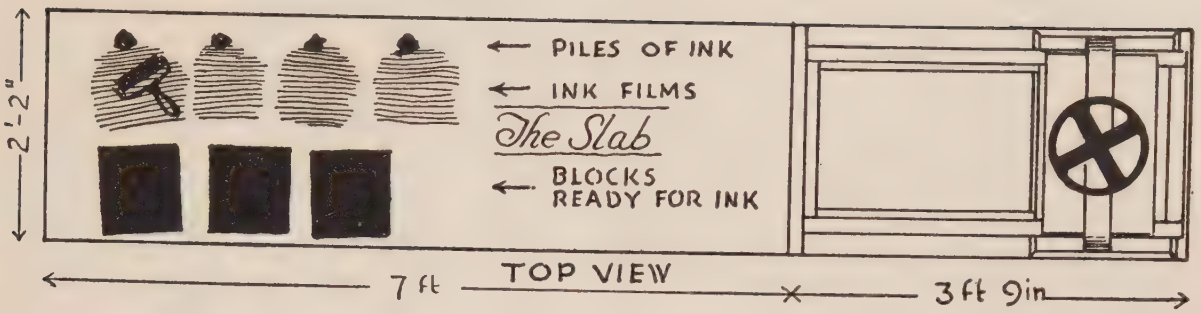
The above suggestions apply to equipment which an artist or student may provide in his own studio. School conditions seldom allow of such generous facilities, and block printing in the schoolroom must be carefully organized in accordance with restrictions of space, time and expense. The opportunity for independent and unlimited experimentation is of course denied the student by such organization, but the situation is no different here than in the presentation of any subject on the school program.

The following plan has been found practical for group instruction. Let us assume that the printing problem calls for black and two colors (a three color job, black being regarded by the printer as a color). The instructor decides upon a limited number of colors—say six—from which each pupil must make his color scheme. This selected color palette should be the result of experimental mixing of the printers' inks by the instructor, who makes printed samples of the chosen colors to be posted in the classroom for the guidance of pupils in planning their color prints.

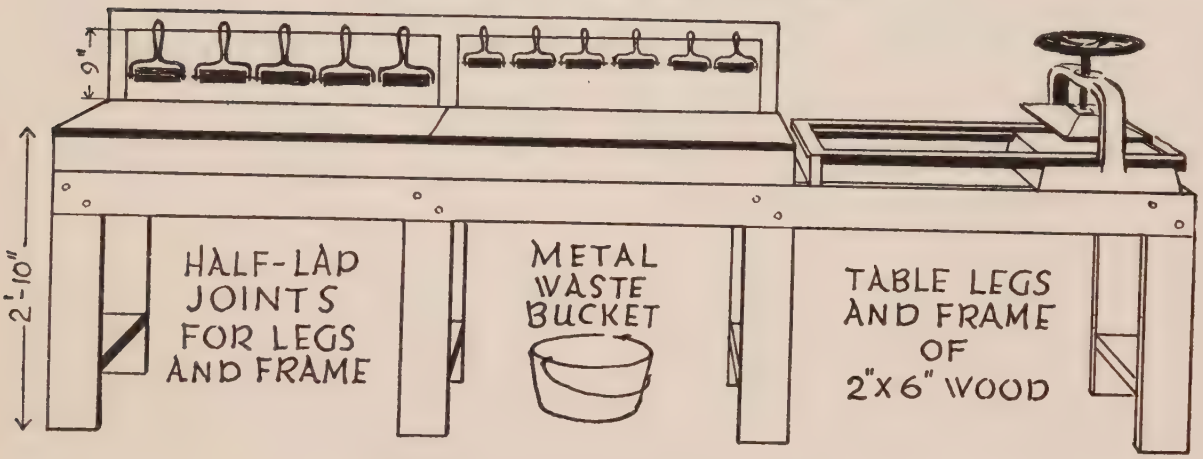
The next step is the mixing of the selected colors in sufficient quantity for the class printing. When mixed, these colors may be put into empty tubes, these being secured from the ink dealers for a small sum. When ready for the printing, a small quantity of each of the colors is squeezed out upon the long center axis of the table or slab as indicated in Fig. A, page 17.

A table five or six feet long by thirty inches wide is suitable for this purpose. A "white wood" kitchen table with a smooth top may be surfaced with brushing lacquer (as described on page 15) and used for this purpose. Such tables can be had with removable legs which permit the storing of the table when not in use. A panel of white wood of similar dimensions can be prepared by the carpenter. This can be laid on top of desks when needed. Marble topped kitchen tables or chemical laboratory tables are ideal, conditions permitting.

THE INK SLAB



AN OUTFIT WHICH IS ADEQUATE FOR QUITE ELABORATE COLOR WORK



FRONT PERSPECTIVE VIEW

AN INK SLAB ARRANGED FOR CLASS PRINTING

THE SLAB SET UP WITH SIX COLORS READY FOR USE

Fig. A

Fig. B

A SEPARATE SLAB FOR THE BLACK INK

Figure 1. A Wood Screw Printing Press.

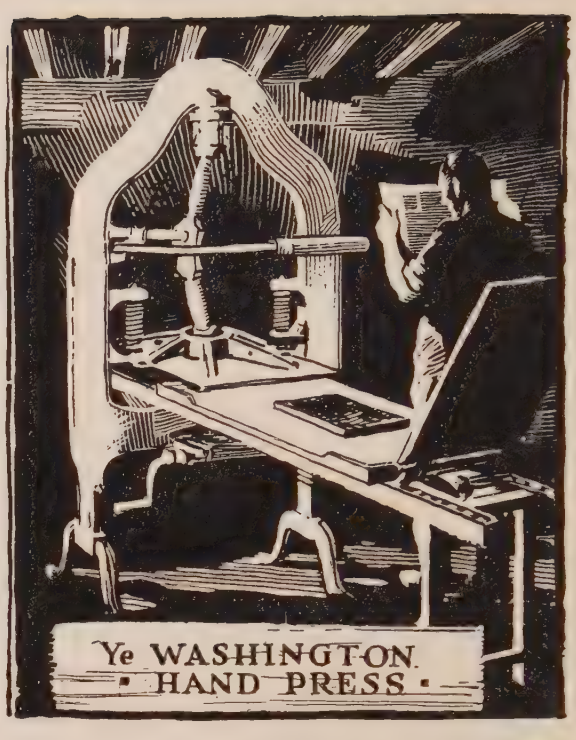


Figure 2. The Washington Hand Press.

The six colors are shown arranged on the print table (Fig. A) ready for use. Two films of each color are rolled up, one on each side of the table. Thus each side of the table presents the same color palette. Several students can work at one time according to this plan. Of course there must be a separate roller for each ink film, twelve altogether. An attempt by students to *mix* colors on the slab or even on their blocks—overlaying one color over another—will destroy the effectiveness of this organization. A rigid rule against this practice must be made when a large number are working at the slab. The black ink should be on a separate slab or table (Fig. B), its isolation assisting in keeping the colors on the large slab clean.

There should be plenty of table space around the print table upon which old magazines may be placed for the cleaning of rollers (by rolling the brayer over the paper). Plenty of cloths for cleaning will be found imperative.

A single press will serve an entire class provided each student uses his own drawing board as a portable press bed. (See Chapter VI, page 19.)

CHAPTER VI

THE PRESS

THE first printing press (Fig. 1, page 18) consisted of a wood screw fastened in a heavy timber frame. When the screw was turned it forced the platen down upon the block and paper which rested upon the bed. From presses of this description issued Gutenberg's Bible and many other of the finest examples of printing of all time.

The screw principle persisted until the early years of the nineteenth century when the toggle joint was substituted. The Washington Hand Press (Fig. 2, page 18) employs this more recent principle and is still in use for pulling proofs by hand. The Washington Hand Press is suitable for printing linoleum blocks, although it has certain limitations. It is a large, heavy affair, and of course is expensive.

The Letter Press, once in use in every important business office for copying letters, is, in the judgment of the author, best adapted to printing from linoleum blocks. When carbon copies made on the typewriter superceded the old method of copying letters, the manufacture of letter presses was discontinued. This has been unfortunate for the block printer. However, discarded presses, stored away in basements and attics, have been brought forth to serve the cause of art. A canvas of the long established business houses in any community should reward the searcher. The smaller sizes are most common, but presses with platens, 15 x 20 inches, may be discovered now and then. The bigger the press the better, even for printing small blocks.

As it is the size of wheel that limits the effectiveness of the press, small presses can be made more useful by substituting large wheels for the original smaller wheels. This alteration can be made in the foundry or blacksmith shop. A cart wheel lashed to the iron press wheel will do quite well. The wheel diameter is the controlling factor: the bigger the wheel the more leverage can be exerted on the screw. A press with a 15 x 20 inch platen, having a fifteen-inch wheel, is a very serviceable press; yet a print of one hundred square inches is about as large as it will produce with ease. An increase of five inches in wheel diameter will probably increase the press capacity to one hundred thirty square inches. An iron bar thrust through the wheel spokes is a useful accessory when unusual pressure is desired. The screw and the ball and socket joint should be kept well greased.

A screw press much like the letter press, but with a very large wheel and equipped with sliding press bed (named the Watson Press), has been designed by the author for linoleum block printing, and is being manufactured and sold by Milton Bradley Co., Springfield, Mass.

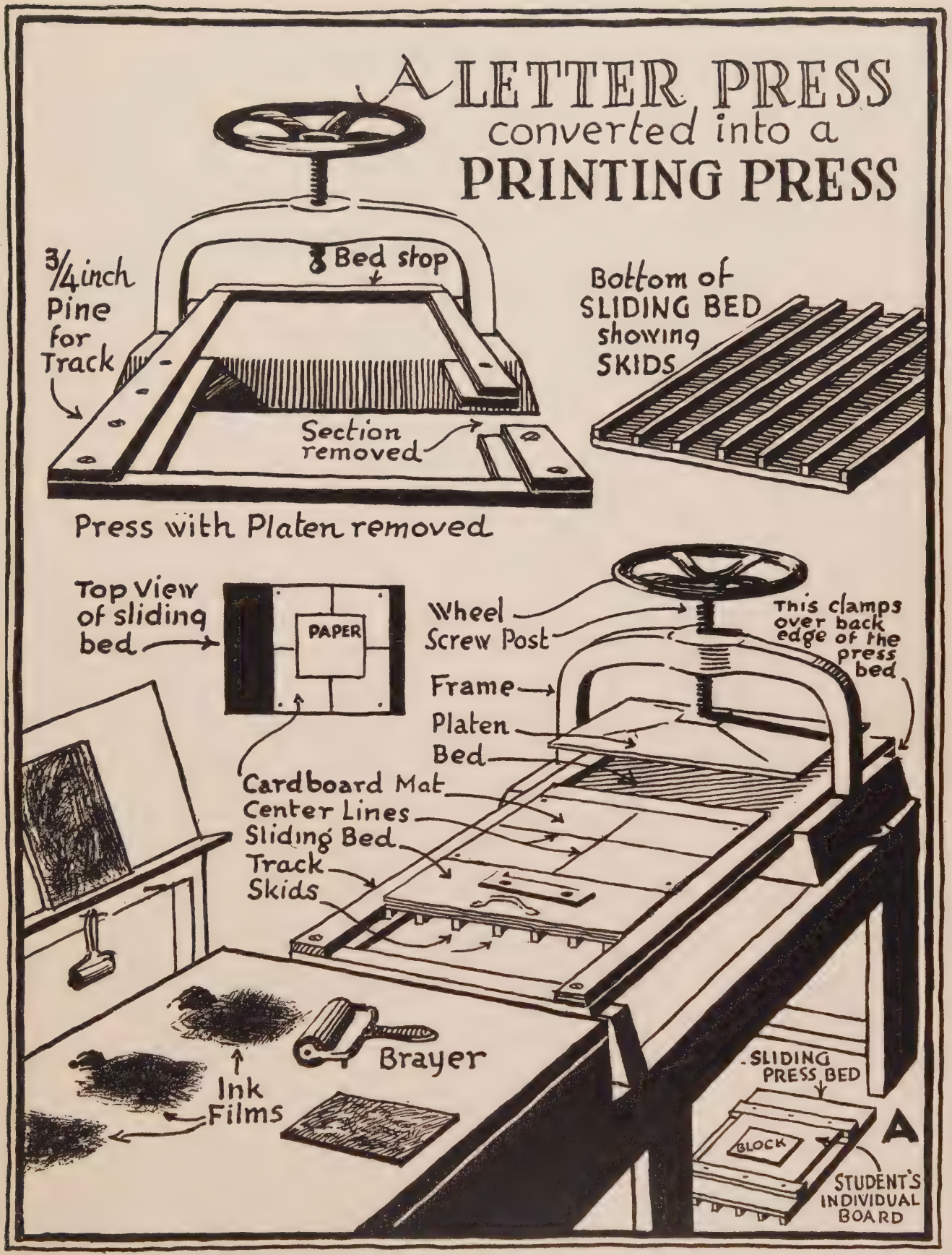
The most convenient way to get the block and paper under the press is to place them on a drawing board which can be readily slipped under the platen. A cardboard mat of smooth material should be laid or tacked on the drawing board; too hard a bed gives poor results.

If much printing is to be done on an ordinary letter press it will pay to rig it as shown on page 21. The outfit illustrated is merely a track upon which the board or sliding bed moves in and out of the press. The sliding bed operates more easily if it is fitted with wood strips or skids which are kept well lubricated

The cardboard mat should be the size of the platen and should be directly under it when the sliding bed is pushed in against the bed stop. The diameters of this rectangle should be drawn with India ink, their intersection giving a central point directly under the screw post. This diagram serves as a guide when laying paper and block upon the bed, enabling the printer to center the job under the press, an essential condition for a successful imprint. The "finder" should rest on the left end of the sliding bed where it is ever at hand for registry work.

Page 17 illustrates a practical arrangement for the print table and press. The press may be placed either at the right or the left of the slab. The bench, which supports both press and ink slab, can be made by any carpenter. The rack for hanging rollers is a great convenience. A rack to hold linoleum blocks, paper, or prints may be built over the roller rack (page 21). If the table is to be built against windows, however, this rack should be omitted, as it will block out light. A north light is, of course, preferred by the color printer as by the painter.

The method of rigging the press described above is entirely practical in a school print shop. If the press is to serve several pupils, the sliding bed should be so constructed as to receive the student's drawing boards (Fig. A). This merely requires two cleats nailed on the sliding bed. Between these the pupil's small drawing boards will rest so that they will be centered under the post when slid under the press. The student's drawing board thus becomes a portable press bed. He can center his paper, locate his block and register color blocks on his individual board elsewhere in the room while others are using the press. When ready


A LETTER PRESS
converted into a
PRINTING PRESS
3/4 inch Pine for Track
Bed stop
Section removed
Press with Platen removed
Bottom of SLIDING BED showing SKIDS
Top View of sliding bed
PAPER
Wheel
Screw Post
This clamps over back edge of the press bed
Frame
Platen
Bed
Cardboard Mat
Center Lines
Sliding Bed
Track
Skids
Brayer
Ink Films
SLIDING PRESS BED
BLOCK
STUDENT'S INDIVIDUAL BOARD
A

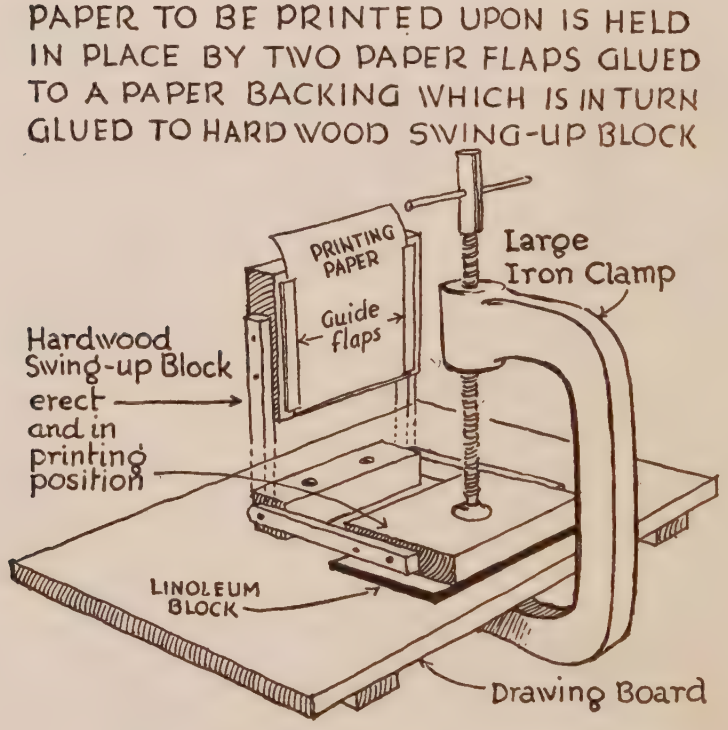
to make the proof, he carries his board to the press, drops it into place on the sliding bed and makes the imprint, a matter of a few seconds. This plan enables a large group to use a single press without waiting.

The track can be eliminated if necessary, the drawing boards in that event resting directly on the iron press bed. But the block must be centered by eye before the imprint is made, a time-consuming and annoying operation to be avoided if possible.

In some schools the clothes wringer has been pressed into service for printing linoleum blocks and it performs as well as can reasonably be expected of it. However, its associations leave something to be desired in the way of artistic inspiration—a matter of no small importance.

A very ingenious press is illustrated below. It was invented by F. Wade Brown and through his courtesy is offered as a suggestion to those whose requirements will be satisfied by this homemade device.

A SIMPLE PRESS
DESIGNED BY F·WADE BROWN



CHAPTER VII

THE ROLLER OR "BRAYER"

THE proper roller for applying printing inks to linoleum blocks is furnished by dealers in printers' supplies and by school supply houses. It is called a "brayer." It is a composition roller cast upon an iron core and set into a handle. When the composition has deteriorated the roller may be removed from the handle and sent to the supply house for re-casting.

Since the brayer composition is sensitive to heat and is quite soft when fresh, it must be carefully handled. If allowed to rest for long on the ink slab or other hard surface it will flatten at the point of contact. A rack should be provided upon which the brayers can hang free. Direct rays of the summer sun will soften or even melt the composition, as will any excessive heat. Because of this sensitivity to heat, the brayer intended for summer use has a slightly different composition than the winter roller. It is soluble in water but is not affected by benzine or gasoline, the cleansing agents in the print shop.

As the brayer ages, it hardens, particularly on the edges, which finally crack open. By cutting off a quarter of an inch of this hardened edge with a razor blade the life of the roller is lengthened—and its length shortened.

For making offset prints, as described in Chapter VIII, the offsetting roller should be quite fresh and soft so that it will make thorough contact with the block and effect a perfect transfer from block to paper.

Brayers are made in various sizes, the smallest being about four inches in length by one inch in diameter. This small roller is excellent for all but large blocks. Indeed it is not the size of the block which dictates what roller shall be used; the nature of the design and character of the inking are more often the determining factors.

The little rubber photo-mounting roller is sometimes used as a substitute for the brayer, but it is a very poor substitute. Rubber is soon ruined by oil and benzine. Furthermore these rollers are hard and are not flexible enough to do a good inking job.

Brayers should of course be cleaned thoroughly with benzine before being put away. First roll them over the pages of old magazines, then finish cleaning with benzine on a cloth.

A CHRISTMAS CARD BY KHOSROV AJOOTIAN.
Exact size of original.

An unusually handsome print which should convincingly refute the opinion rather commonly entertained, that a linoleum-cut can have at best a clumsy style of beauty. Here is strength combined with refinement and considerable delicacy, and a complete understanding of the possibilities and the limitations of the medium. Note that most of the fine line is *white* line and that where thin black lines appear they are artfully supported by black masses.

CHAPTER VIII

PRINTING WITHOUT A PRESS

THE desirability of a press in printing from linoleum blocks is not likely to be disputed. But a printing press is not absolutely essential and when conditions forbid its use various methods of taking impressions may be employed.

The most perfect prints ever made did not come from a press. The Japanese, who produced them, secured the necessary contact of block and paper by rubbing the back of the paper with a burnisher or "baren." This was a pad with bamboo leaves stretched over it to give a smooth rubbing surface. Modern print makers employing the Japanese method take their impressions by this same means. Linoleum prints can be made in this way but the successful handling of the baren implies a skill beyond the reach of the average amateur.

Amateur printers sometimes substitute the bowl of a spoon or some other smooth, rounded object for rubbing impressions from linoleum blocks. A hard rubber roller such as is used for mounting photos may serve the same purpose. But the paper is likely to slip in the rubbing method and thus give a blurred impression. Furthermore it is hard to apply uniform pressure with the baren at every point, a condition which is essential to a perfect impression. The best results are obtained by the rubbing method when a very thin paper is used. Thin paper sticks to the inked block at once and prevents slipping. As it is also transparent, the printer can tell when he has a good print without peeping under a lifted corner.

Small prints can be made by bearing down upon the block with the hands, the weight of the body affording the necessary pressure. Body weight can be even more effectively used by standing upon the block with one foot. But impressions taken by this means are seldom perfect, the tendency of the block to rock being very hard to overcome. Successful results by these methods depend in large measure upon the bed on which printing paper and block lie when receiving pressure. Use a smooth table or drawing board covered with newspapers or blotters. Experiments will determine how much padding is needed.

"Offset" printing offers the best means of printing without a press. In this process the block does not touch the paper at all; the impression is taken from the inked block by a clean brayer and from it transferred to the paper.

LIBRARY
THE MASTER'S COLLEGE
NEWHALL CALIFORNIA

When preparing a block for "direct" printing (from block direct to paper) the design must be cut in reverse on the linoleum, especially when it includes letters or numerals. This is not necessary in offset printing. The offset print will duplicate the design on the block, an important advantage in all work involving lettering as it is much easier to engrave letters in their normal position than in reverse.

Both the engraving and inking must be neatly done for offset. A clean, rather deep cutting is needed to keep the background from being touched by both ink and offset rollers. The ink should be rather thin.

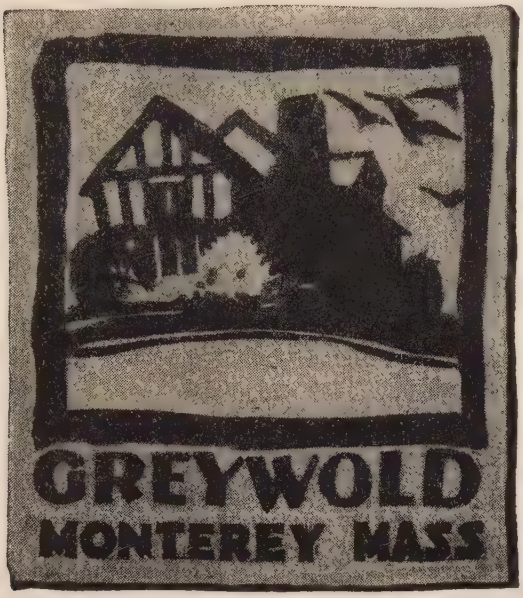
The offset roller (the same type of brayer as is used for inking) should be freshly cast, and soft—brayers become hard with age. It ought, of course, to be perfectly clean before it is rolled over the inked block to receive the impression. Do not press down hard on the roller; its weight alone is almost sufficient to give it a firm contact.

To make the print, the offset roller, which now carries the design in reverse on its circumference, is rolled over the paper and the print is made. Not all the ink is discharged, however, and two or three additional prints can be had, each succeeding print being lighter. The offset roller must then be cleaned with benzine and thoroughly dried before repeating the operation. Rolling the brayer over cheese cloth dampened with benzine, then over dry cloth, will cleanse the brayer very quickly.

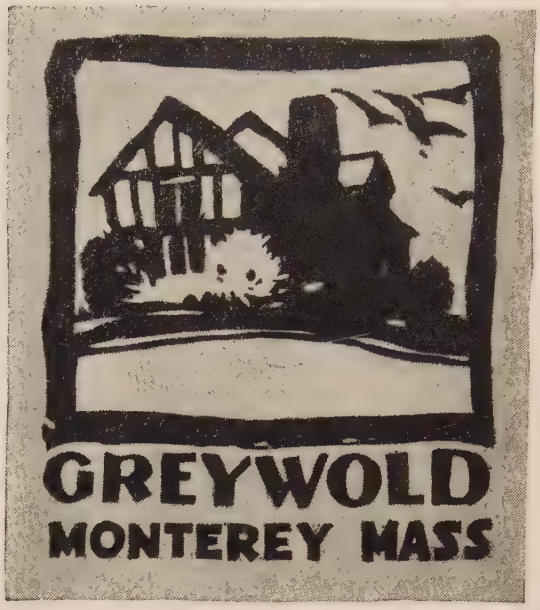
Offset prints have an individual character. They lack the emphatic edges of a direct print and are, in consequence, softer and more atmospheric. As in direct printing, the kind of paper used is a big factor in the effect and the student should try various surfaces.

A roller four inches long with a diameter of two inches will make a print $3\frac{1}{2} \times 5$ inches. The entire circumference (about six inches) cannot be used, as an inch or so of dead space is needed for margins. There is practically no restriction in size of offset prints, as very large rollers can be secured from The American Type Founders Co. of New York.

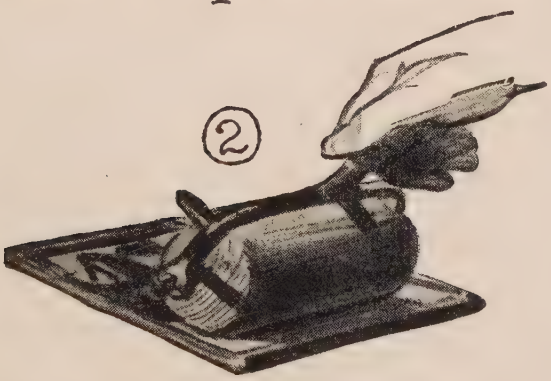
The offset method has its limitations, chief of which is the difficulty of locating the impression on the paper. However, if the print be made on a large sheet, the paper can later be trimmed to fit the picture. The lack of a method of registry in this process confines its use to single pull prints.

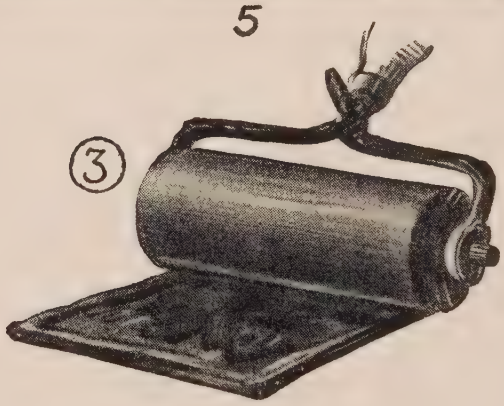


1

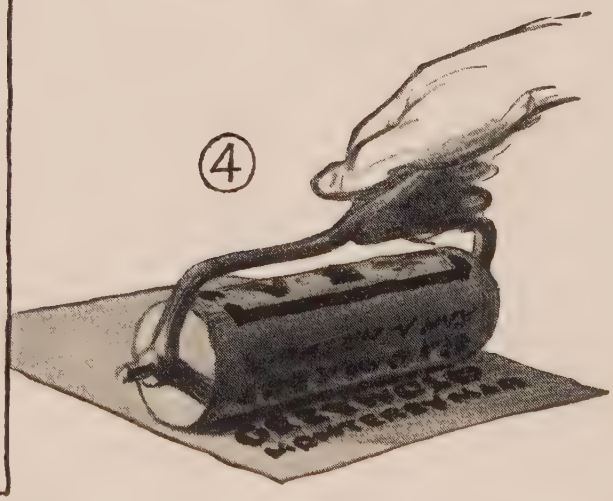


5





1 INDIA INK DRAWING ON THE LINOLEUM BLOCK *Ready for Engraving*
2 INKING THE ENGRAVED BLOCK *in the usual way*
3 ROLLING A CLEAN BRAYER OVER THE INKED BLOCK *to take off the impression*
4 OFFSETTING DESIGN TO TINTED PAPER
5 THE OFFSET PRINT



CHAPTER IX

TRANSFERRING THE DESIGN TO THE BLOCK

WHEN possible, the transferring process should be avoided altogether by direct drawing upon the linoleum. After the design has been studied in preliminary sketches, the final drawing may as well be made upon the block itself. Perhaps it is not generally realized that it is as simple to do this as to make the final study upon paper with the idea of transferring it. India ink, charcoal, and pencil can all be used for direct drawing upon the block.

India ink is perhaps the best medium for this purpose. To prevent the ink from "crawling" when brushed upon the linoleum, first wash the block with household ammonia. Ink drawings may be corrected very easily by scraping with a sharp penknife or a razor blade; these scraping tools take the place of the eraser.

Linoleum takes soft charcoal quite well and the same method of handling the medium may be employed as when drawing upon paper. "Fix" the drawing in the usual manner.

Carbon, litho, and China-marking pencils may be used but graphite pencils are not satisfactory because of their "shine."

It is not always advisable to draw directly upon the block, the artist desiring for various reasons to make his original study on paper. When this is done the design must be transferred to the linoleum.

Transferring is almost certain to subtract something of delicacy and precision from the original drawing unless it is done by some entirely mechanical means such as offsetting, which is described on the following page. The process of tracing on transparent paper and then transferring from tracing to block by the use of carbon paper is the usual method of getting the design on the linoleum. But it is seldom well done; there are so many chances for inaccuracy. Tracing from the drawing is the first chance; retracing the outline when transferring is the second; and the almost certain shifting of the tracing is still another. Unless the pencil is kept well pointed—which is unlikely—serious deviations from the original contours are to be expected. Yet, since this method of transferring must be employed in many cases, the recital of these difficulties may help the student to overcome them to a degree.

TRANSFERRING THE DESIGN TO THE BLOCK

After the outlines of the design have been transferred to the block, the masses should be blackened in with India ink so that the design on the block gives an exact impression of the mass effect to be produced in the print. This is important, although the beginner may consider it unnecessary, believing he can follow the outlines satisfactorily in his cutting. But with the printing areas covered with ink there is no danger of cutting out parts which should be left in relief.

If the linoleum block be coated with Chinese White, the carbon transfer lines will be easier to follow. Make the white wash very thin and stroke back and forth until dry. If a thick coat of white is applied it will chip when the engraving is being done.

A drawing made upon paper with waterproof India ink can be "offset" to the block by the following process. In the first place the drawing should be on thin paper. Cut a piece of blotting paper slightly larger than the drawing and lay it down upon a folded newspaper or a magazine. Saturate the blotter with household ammonia by pouring the liquid directly from the bottle. Lay the drawing down upon the wet blotter, inked side up, and press it gently into contact with the blotter until it becomes saturated and lies flat on the blotter. Next place the linoleum block, face down, on the drawing and put the newspaper with drawing and block under the press. Apply considerable pressure. The drawing is by this means offset upon the block and it appears in reverse. The print will therefore face the same way as the original drawing. To secure a perfect offset first smooth the block with sandpaper. The kind of paper and ink used—India inks vary slightly in composition—influences the length of time needed under the press. One minute may suffice; fifteen or more may be required.

If the original design be in charcoal on paper it can be offset by laying the linoleum block (sanded smooth) face down upon the drawing and putting in the press. Usually a good offset can be made in this way although there may be parts which are rather indistinct. These can be touched up with soft charcoal or, if preferred, with brush and India ink. After spraying the block with fixatif, it is ready for engraving.

CHAPTER X

WITH BRUSH AND GOUGE

Black-line and White-line

BEFORE beginning the cutting of blocks one can learn much about the art of block printing through experiments with brush and ink. As fine lines and intricate details are to be avoided in linoleum prints the pen should not be used. A number 3 or 5 sable brush, blunted by clipping off the pointed tip, gives a bold, vigorous handling better suited to the work in hand.

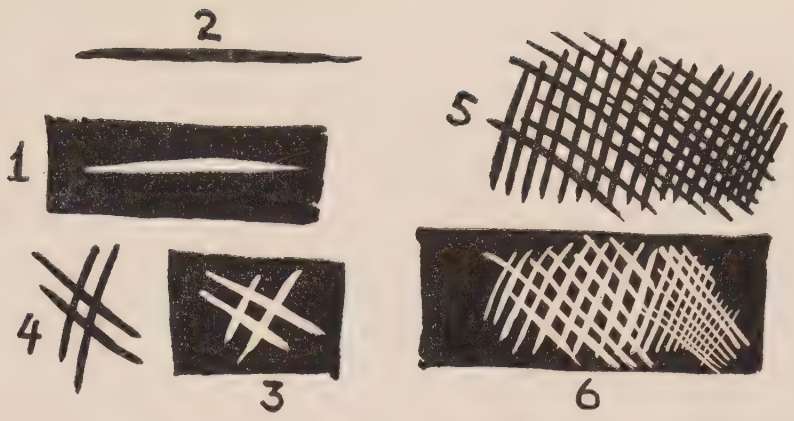
With the brush and India ink make many rapid drawings on white paper. Preliminary pencil guide lines should be avoided, the ink drawings being *conceived* with the brush itself. The result is more likely to be spontaneous, spirited, and suited to the linoleum print.

The student who has never made direct brush drawings will be interested to find that these rapid sketches done without premeditation possess a freshness and charm lacking in studies over which he has labored. He will not often secure good results at the first effort, but since he spends but a short time on each sketch he is willing to make several and thus more completely employ his inventive power.

Next dip the brush in white ink and draw with the white brush on black paper. Tack these white ink drawings on the wall in one group and the black ink sketches in another group. Note that the two methods of working have produced results of widely differing character.

One who is familiar with woodcuts or linoleum-cuts observes that the white ink drawings bear a striking resemblance to them. This is because the white brush actually performs the same service in making the picture as does the gouge used in engraving. A gouge cut in the linoleum means a white line in the print; a white brush stroke on black paper gives a white line in the drawing. Furthermore, a blunt brush with thick white ink gives a line character strikingly like a gouge cut in the block. From this it is evident that a white drawing on black is a more direct method to employ in making preliminary studies for block prints.

To produce a white line in a print (Fig. 1, page 31) requires a single gouge cut in the block; to print the black line (Fig. 2) several cuts must be made in the block, one cut on each side of the line and several to remove the surrounding white background. The white cross-hatch (Fig. 3) results from four gouge cuts; the black cross-hatch (Fig. 4)



demands many, the digging out of the white square being a tiresome operation if indefinitely repeated. It is evident that the engraving of Fig. 5 is accomplished with far greater labor than that of Fig. 6.

After experimenting along these lines the student looks with amazement upon the intricate black-line engraving of the old masters, often elaborately cross-hatched. An examination of a Durer woodcut (page 71) fills one with wonder that enough skill and patience could have existed to cut elaborate renderings of this description upon wood. It is not surprising that the discovery of the white-line and its development into a definite system of engraving by Thomas Bewick in England late in the eighteenth century was hailed with enthusiasm and that it revolutionized print making and book illustration.

But the labor-saving feature of white-line engraving was by no means the only reason for its popularity. Indeed white-line engraving can and did become amazingly intricate and difficult. White-line opened up new possibilities. It empowered the artist to do what could not formerly be done. It introduced new qualities. The wood-engraving became a tonal expression, delicate gradation of dark and light taking the place of uncompromising line. The tones of an oil painting could now be successfully reproduced with the white-line burin. (See illustration, page 39.)

Yet it must not be assumed that the advent of white-line engraving ushered out the old woodcut altogether. Since the new technique was so different it could not permanently eclipse the old. For a time, black-line, it is true, fell into disuse, but later it revived and flourished along with white-line, each possessing a charm not attainable by the other, each a distinct technique.

Just as artists continued to make black-line prints after the introduction of white-line engraving, so will the student of block printing wish to work in black-line as well as with white-line. Even though there is more labor in the former method it is preferred by many, in fact by the majority of those making block prints today.

But the linoleum-engraver, with gouge in hand, can scarcely avoid using white-line to a certain extent even when he sets out to produce a black-line effect. It is so easy to draw with the gouge that he naturally employs white-line freely in working up the darker areas of the design. So in most cuts the combination of the two techniques is an interesting and frequent occurrence.

The Williams College Chapel print (page 35) shows such a combination. The upper half is in black-line, the lower part, white-line. The character of the brush work in the black cloud lines has been faithfully preserved in the cut—the original study was done with brush and ink—but where the clouds merge into the black masses below, the change of method is apparent, it being quite evident that the gouge engraved these thin white lines freely. The cutting of the lights on the trees seems likewise to have been thought out with the gouge itself rather than with the brush of the original drawing.

On the other hand, the James I. Oak Chair on page 41 is an example of pure white-line work. One is conscious here of the emergence of the white design from a black background. There is no suggestion of a brush or pen line drawn in black upon the block and consciously preserved in the engraving. Whatever drawing was done on this block before cutting was in the nature of a layout, that is, guide lines to indicate the placing of important masses.

Henry Shire, whose "Wild Duck" appears on page 33, explained that he made but a sketchy outline of the head, drawing directly from a fowl which he brought down with his gun. The engraving therefore was freely done with his gouge in true white-line style.

White-line is particularly tempting to the linoleum-engraver because this technique permits considerable delicacy of treatment which is denied him by black-line. Fine black lines are impractical in linoleum—they are too fragile—but thin white lines may be employed almost without restraint. Such a block as the "Deer in Winter Landscape" and the "Egret Family" will make thousands of prints without showing wear.

WILD DUCK by HENRY SHIRE.

EGRET FAMILY by MARGARET BROOKS.
Black printed on gray paper.

DEER IN WINTER LANDSCAPE.
Printed in a light tone over a tint.

WILLIAMS COLLEGE CHAPEL
by ERNEST W. WATSON.
Original print 7¾ x 10 inches.

1 By MARGARET A. KARRBERG

2 By GERTRUDE CASWELL

The orignal linoleum-engravings for these illustrations are six inches square

3 By DOLORIS LYNCH

4 By GLADYS A. WILSON

5 By MAY G. BARRETT

6 By GERTRUDE CASWELL

1 By BETTY CORRIGAN

2 By VERNA BAUER

The original linoleum-engravings for these illustrations are six inches square

3 By KATHERINE McDERMOTT

4 By ELLA C. HALPIN

5 By E. W. SUSSMANN

6 By GERTRUDE CASWELL

CHAPTER XI

FURTHER EXPERIMENTS IN WHITE-LINE

THE beginner in art inevitably thinks and draws in outline. It could hardly be otherwise as he has been brought up on the pencil, a tool which makes lines. All form therefore is naturally represented at first by contour lines.

Linoleum is essentially a "mass" medium and the student should as soon as possible learn to design in mass; but his first engraving might well be done in line, with which he feels more at home.

Because he has been accustomed to pencil and paper, the student finds the black line more satisfying than white line on a black ground. White on black suggests the negative. However, his first blocks might profitably be done in white-line, which is a more direct method and much easier to manage. He will soon become accustomed to the white line and will finally realize that white outline is as logical as black.

Such white-line blocks as those reproduced on page 36 illustrate the simplest form of engraving and are suitable for the beginner's first attempts. A single tool (a small U-veiner) is used for all lines. The result resembles a chalk drawing on the blackboard, the line merely giving the contours of the forms represented. Some students with a design instinct give the blocks a decorative treatment (Figs. 2 and 3). Others handle the line in a sketchy way much as they would the pencil.

But if the amateur printer is left alone in this outline work his mental attitude and his method of expression gradually change. While the white outline, a non-realistic, symbolic type of rendering, satisfies him for a time, the desire comes to reproduce the actual appearance of the object, to suggest light and shade, to introduce the third dimension, in fact to give the illusion of reality.

He approaches this objective first by accenting his line so as to suggest light and shade (Figs. 5 and 6), cutting a broader line on the illuminated contour. The next step is to place a few high lights on the form (Figs. 1 and 2, page 37). This rendering of the illuminated planes is bound to make the outlines appear less important and it is but a step to such a treatment as Fig. 3 where outline has almost disappeared, and finally to complete absence of outline, as in Figs. 5 and 6.

FURTHER EXPERIMENTS IN WHITE-LINE

The student is now committed to the production of tones composed of fine white lines in parallel arrangement varying in width and in spacing according to the tone he wishes to represent, a technique well illustrated in the white-line wood-engraving by Timothy Cole reproduced below.

When he has gone thus far he has arrived at an understanding of white-line engraving and an appreciation of its beauty in the hands of a master. If this type of engraving tempts him to further effort he should begin to engrave on end grain wood blocks with the graver or burin; linoleum can carry him no further in this direction.

A WHITE-LINE WOOD-ENGRAVING BY TIMOTHY COLE.
(Reproduced exact size of original)
After "Fishing Boats Off Yarmouth," an oil painting by John Sell Cotman.
Copyrighted by The Century Publishing Co. and reproduced by their courtesy.
Taken from "OLD ENGLISH MASTERS" published by Century.

By ELEANOR MATHIASON

By E. M. MATTOON

The original linoleum-engravings are six inches square

This layout for the cut at the right would actually appear in reverse on the block. It is shown here in this position that layout and cut may be more easily compared.

By STELLA ENGLESON

The two upper cuts were made with no layout lines whatsoever; the block was coated with black ink and the engraving done without preliminary study of the design. The ship block started with the simple layout shown in the lower left square, these lines being sketched with a white pencil.

JAMES I. OAK CHAIR
by ERNEST W. WATSON.
Exact size of original.

CHAPTER XII
REGISTRY

IN color printing, a separate block must be provided for each color and some means devised so that every block will deposit its color upon the print in exactly the right place in the design. "Registry" is the term used to designate this operation.

The devices employed in mechanical printing are not useful to those doing hand printing by methods outlined in this book and will not be demonstrated here.

The Japanese secured registry by cutting a corner on each block into which the paper was laid. A notch cut in the block on a side adjacent to this corner served as a guide for the edge of the paper. (See illustration, page 43.) The paper was thus laid down upon the block and the imprint made by rubbing the burnisher or "baren" over the back of the paper to bring it into perfect contact with the inked block. This method is in use today by those working in the Japanese manner.

The Japanese registry device is unsuited to the needs of the linoleum printer working with a press, but the two methods have this in common: both employ a corner and an edge on an adjacent side. Since the block (in our method) is laid down upon the paper it is obvious that notches cut on its face would be useless. The corner and edge are furnished by a "finder," pictured on page 43. This finder is laid down upon the paper and each color block is dropped into place with its upper left corner and left edge in contact with the finder as shown.

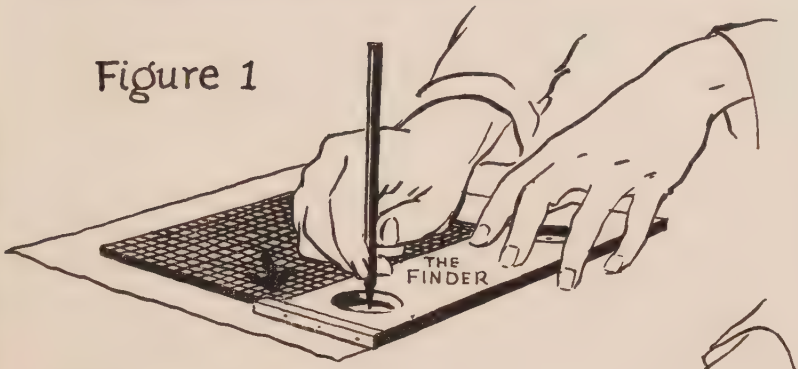
If the finder were thinner than the blocks it could be tacked down upon the paper and left in place throughout the printing process. But this plan has certain disadvantages, among which is the difficulty of setting blocks against the slight edge of such a thin finder. It is better to have a finder one-quarter or three-eighths of an inch thick. The finder being thicker than the blocks must be removed from the paper after serving to register each block in turn and before the job goes under the press. Some means must be provided for replacing the finder in the same position on the paper each time. Its original location must be marked before it is removed.

Two holes are cut in the finder and covered with transparent celluloid on the back. A pin hole in each "window" permits a sharp pencil to make two points on the paper. Replacing the finder then becomes a simple matter.

REGISTRY

Now, the employment of the finder in printing, as described above, presupposes its use in the preparation of the color blocks. Unless each block is engraved with relation to the working corner and edge supplied by the finder, this registry device is useless. The blocks must be "worked up" by means of the finder. This involves the process of "offsetting," which is described in the following chapter.

Figure 1



It is advisable to indicate the "working corner" on the back of each block by a black arrow

Fig. 1 shows the printer making registry dots thru the "eyes" of the finder which is in place against the working corner of the block

Figure 2

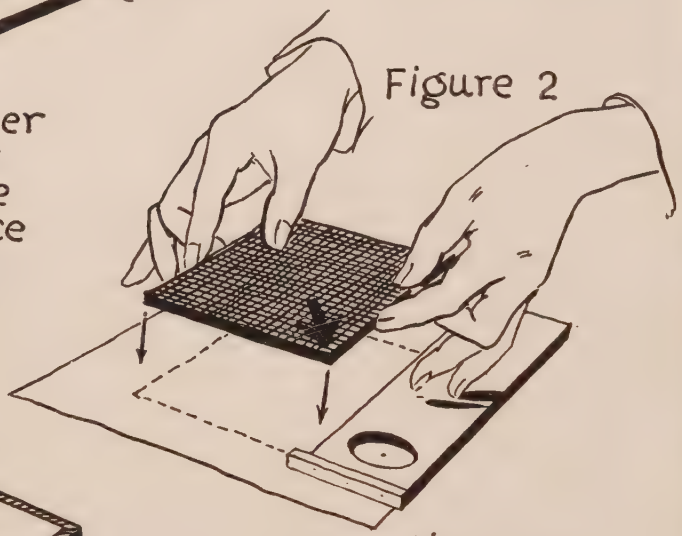
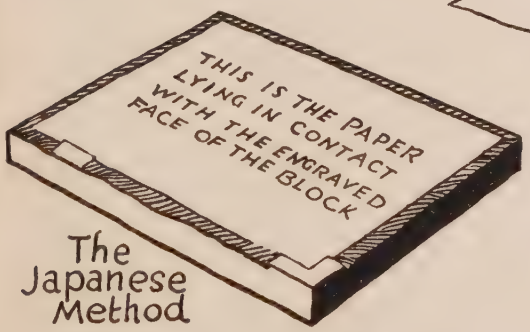


Fig. 2 gives the correct method for holding the block. The third and fourth fingers are left free to steady the finder as the block is lowered into position.



The Japanese Method

A corner and side notch cut in the face of block

CHAPTER XIII

OFFSETTING

OFFSETTING is an almost indispensable operation in engraving linoleum blocks for color printing. It not only saves time otherwise spent in tracing but is an assurance of absolute accuracy.

The best way to demonstrate offsetting is to describe the making of a given set of color blocks in the preparation of which offsetting plays a prominent part. The print of the Soldier on page 45 will serve our purpose very well. Instead of explaining how the job *was* done, directions for procedure will be given just as though the student intended to duplicate this very print. As a matter of fact, that would be an excellent lesson for the beginner.

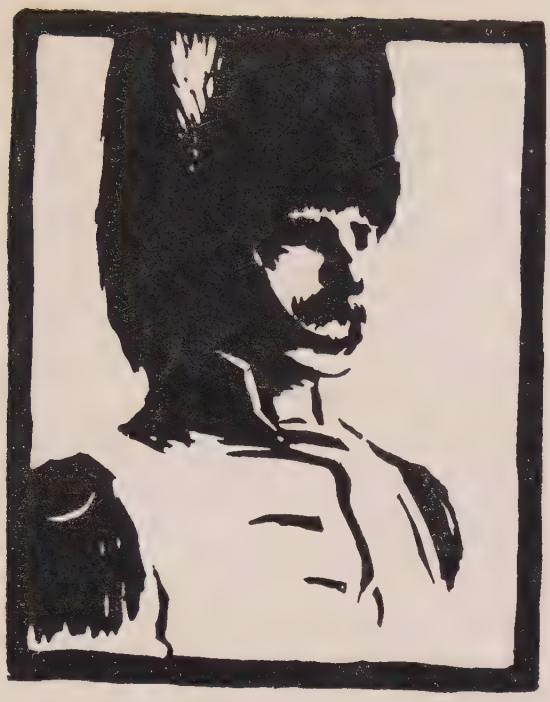
Make your original drawing (Fig. 1, page 45) in India ink or in charcoal on paper and offset it to the linoleum as described in Chapter IX. In case the offset appears weak, as it does in Fig. 2, go over it with brush and India ink so the pattern will be easier to engrave (Fig. 3). If the original be in charcoal, of course the charcoal offset on the block must first be sprayed with fixatif before strengthening with ink. Remember that a smooth block takes a better offset.

Next engrave the block by cutting away the background and leaving the blackened portions in relief. A proof pulled from this block (Fig. 4) shows the figure reversed in position, but facing the same way as the original drawing (Fig. 1).

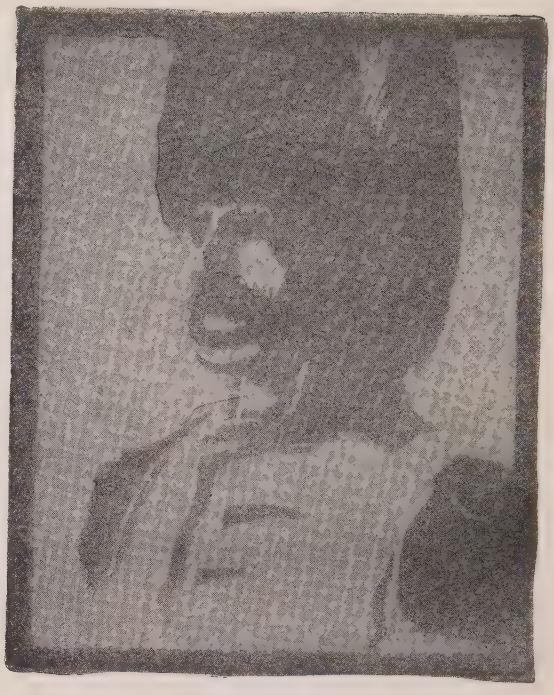
This block, which will print the black, is called the "key" block because it "carries the design." In a set of color blocks for a given print, the block which most completely supplies the outlines of the design is called the key block, the key to the design. The key block is by no means always printed in black. Often there appears to be no key block at all, no single block giving anything like a complete impression of the subject. In Japanese prints, however, the general practice was to definitely outline all color areas by lines engraved on the key block.

The next step is to prepare the color blocks for our print. Whether we make the blue or the red block first matters little. Let us start with the blue which covers the entire background (see page 46). Make an offset from the key block to the "virgin" block. A "virgin" block is a plain block which has neither been drawn upon nor engraved. This is done by

PREPARATION OF KEY BLOCK



1
India ink drawing made with brush on paper.



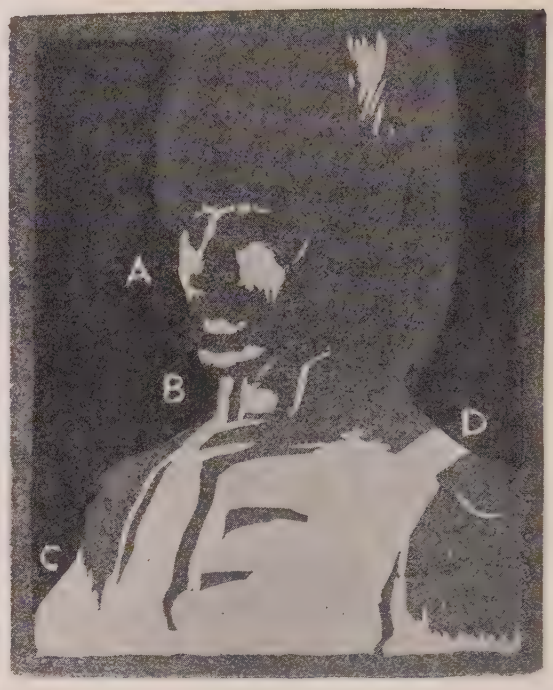
2
Offset on "virgin" block from the original warding. A rather weak transfer.

3
The same offset being strengthened by brushing india ink on the pattern to be left in relief after background has been removed.

4
A proof pulled from the block (Fig. 3) after it has been engraved.

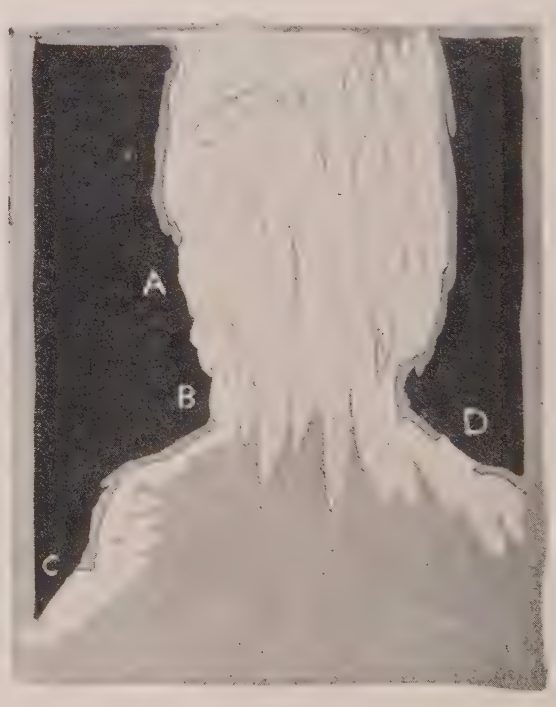
PREPARATION OF BLUE BLOCK

1
Offset from "key" block to the virgin block.



2
The same block as shown in Fig. 1, with areas to print blue color brushed in with India ink.

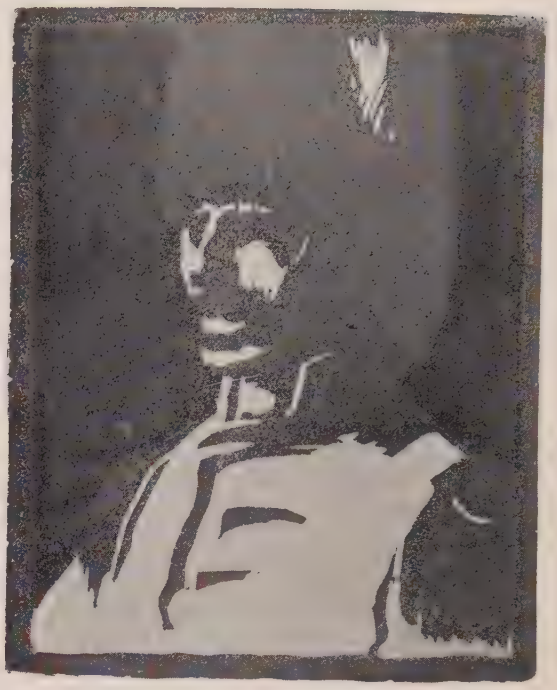
3
The same block after the offset has been washed off with benzine leaving the india ink. These ink areas will be left in relief.



4
The blue block partially engraved showing the narrow margins left next to the black edges of background masses to provide for the lapping of adjacent colors in the print.

PREPARATION OF RED BLOCK

1
Offset from "key" block to virgin block.



2
The same block, to which an offset from the blue block has been added.

3
The same block after engraving, showing the edge of black left for underlap where red and black are to meet. The white strap is indicated in pencil.

4
The same as Fig. 3, except that the block has been washed with benzine to remove the black ink underlap margins. The strap has been engraved.

PROCESS COLOR PROOFS

1 Proof from blue block.

2 Proof from red block.

3 Proof from key block.

4 The finished print.

PROCESS COLOR PROOFS

1 Proof from red block.

2 Proof from blue block.

3 Proof of blue over red.

4 The finished print.

making a print from the key block on a piece of paper (newspaper is good). Use black ink or any color.

After making the imprint and before removing the block, place the finder on the paper against the block (Fig. 1, page 43), and record its position with pencil dots. Lift off the key block, holding the finder firmly in place with the left hand. After assuring yourself that the finder has not slipped from position—by looking at dots and holes— lay the uncut block down on the wet print against the finder. Put in the press and give considerable pressure.

The offset should look like Fig. 1, page 46. If black ink be used the offset should look quite dark and clear. A light colored ink will give an offset which would be hopeless were it not possible to bring out the design with charcoal dust. To do this, sprinkle dust upon the wet offset—rub a charcoal stick on fine sandpaper held over the block—and distribute over entire block by rubbing with palm of hand. Rub gently at first, then harder. The dust will cling to the inked areas and bring out the pattern clear and strong. Remove surplus charcoal by gentle rubbing with a cloth. Even though black ink be used and a satisfactory offset is secured, it is advisable to use the black dust as it "fixes" the offset and protects it from smearing when the engraving is being done.

14086

The next step is to cover the background with India ink (Fig. 2). These areas are to be in relief, and it is often advisable to blacken all relief areas. This is, in the main, merely a matter of filling in the spaces indicated by the design offset upon the block. However, there are a few points, A, B, C, and D (Fig. 2), where the blue block must supply outlines which are missing in the key.

After the India ink has dried, saturate a cloth with benzine and wash the block, rubbing quite hard. This will remove the charcoal dusted offset and leave the India ink pattern which is to be left in relief on the blue block (Fig. 3). The block is now ready to engrave.

If the background be cut away exactly to the black edges the finished print would surely show a white line here and there, where, through trifling inaccuracies of cutting or registry, the blue and black blocks would fail to match. To prevent this do not cut to the line but leave a narrow fringe adjacent to the masses, except at points A, B, C, and D (see Fig. 4). This fringe will thus underlap the black in the print.

To prepare the red block, make an offset from the key to the virgin block as you did in working up the blue block (Fig. 1, page 47).

Next offset the blue block (the background) on to this same block, right on top of the first offset, giving the effect shown in Fig. 2. Some of the contours of the figure are now lost in the background, but the areas to be left in relief stand out light, in sharp contrast with it.

Blackening the relief areas with India ink, as recommended in making the blue block, would in this case be confusing. It is better to begin engraving at once, cutting, not to the line, but allowing a little margin to serve as "underlap" in printing. After engraving, the block should look like Fig. 3, the underlap appearing as dark outlines around the relief masses. There is no need of cutting away the slender black lines of the coat lapel from this block.

Fig. 4 shows the block after being washed with benzine to remove the black ink of the underlaps.

Page 48 shows proofs from the black, red, and blue blocks. The finished print is made by printing these three blocks in turn, the black block going on last. After printing the first block (blue), and before lifting it from the paper, place the finder on the paper against its working corner and "locate" it with the dots. Ink the red block and lay in place against the finder. Then do the same with the black block.

CHAPTER XIV

FLAT COLOR PRINTING

THE natural desire for color in the print is at least partially satisfied by the use of tint-blocks. A tint-block (Fig. 1, page 55) is a virgin block, that is, one without engraving. When inked with a flat color and printed as a background for any single pull print, the tint-block thus furnishes a simple means for color enrichment.

The tint-block may be the exact size of the engraved block or it can be made enough larger to provide a border of color around the design as in Fig. 2. In either case the use of a finder is unnecessary for registry, it being easy enough to lay the engraved block down upon the printed tint in the correct position without mechanical aid. The engraved block can just as well be inked with any dark color as with black, thus giving a more colorful effect. When a colored paper is selected, a three-color job results.

Tint-blocks give the student considerable color satisfaction without adding materially to the time and effort spent in the preparation of blocks. Moreover they serve as a very natural transition to more complicated printing, involving several engraved blocks. As a matter of fact the tint-block introduces color printing in the most natural and alluring fashion—through the process of discovery. A person with imagination is certain to discover the possibility of securing greater effect by doing a little cutting on the tint-block, as in Fig. 3. By this simple means the interest of the print is enhanced and the student is at the same time carried forward on the wave of his own creative genius into the fascinating realm of color printing.

The desire for further color interest is of course inevitable and the ambitious student will desire to add another block and still another to meet his demand for more varied color effects. Chapters XII and XIII on Registry and Offsetting describe in detail how the various color blocks are prepared and printed so that each block accurately discharges its pigment in the designated area in the picture. The printing areas of each block are made slightly larger than their corresponding areas in the print so that the colors will overlap a trifle. If the blocks be so designed as to make the colors exactly meet, the slightest accidents in engraving or printing will show in the print. The overlap takes care of such inaccuracies.

The effect of this overlapping is often observed in the finished print by a faint line—the width of the lap—which separates one color from another. An examination of pictures printed on commercial presses reveals the same defect, for defect it is. This condition is usually accepted in ordinary printing without objection, but the color blocks can be designed so as to almost eliminate this kind of lapping. This is accomplished with no extra difficulty by the method recommended below.

The color print of the Soldier on page 48 was made from blocks so prepared as to deposit their colors exactly in the designated areas. They were cut to lap slightly as described in Chapter XIII. These laps can be seen in the finished print. Quite a different color distribution is seen in the red and blue blocks on page 49 which illustrates the preferred method, The technique here demonstrated is superior for several reasons. The color blocks have larger relief areas and are easier to ink. There is no tendency of "rocking" of the roller as with the red and blue blocks on page 48. Furthermore there is less danger of "drag" (drag refers to the accidental slipping or sliding of the inked brayer as it is rolled over the linoleum block) in inking a block with generous relief areas.

Better printing technique is likewise possible, due to the larger printing areas and their balanced distribution on the block. The borders on these blocks also facilitate handling, inking and printing. The Florentine woodcut artists understood these practical considerations and the technical excellence of their work was partly due to well designed blocks with good arrangement of relief areas and with decorative borders, which thus had a practical as well as an artistic purpose. (See illustration, page 11.)

Prints which are built up with colors laid one over the other like that on page 49 have more richness and depth. They are also likely to be softer and more atmospheric.

When the blue block (Fig. 2, page 49) is printed over the red (Fig. 1), a third color appears where the two colors overlap. This combination color (see Fig. 3) is almost entirely covered by the black in the finished picture—a small area of the purple remains on the strap at the shoulder—but had it been desirable, this color might have been used for the face, epaulets, or collar. The clever block printer soon learns to make the most of such combination colors and frequently produces the effect of a complicated color job with the use of but a few blocks.

LINOLEUM CUT by WALTER R. RHODES.
Church of Notre Dame, Bruges, Belgium.

CHAPTER XV

COLOR GRADATIONS AND BLENDINGS

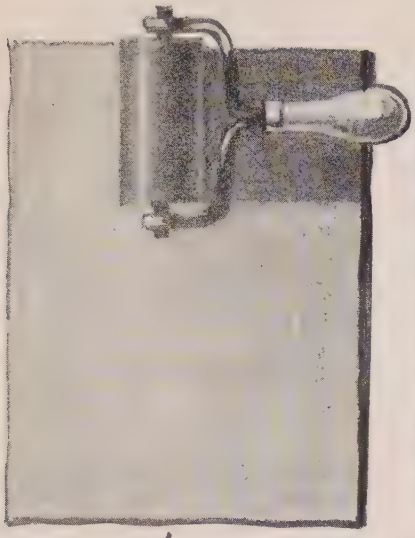
AFTER the student has become acquainted with flat color printing he may wish to experiment with gradations like those shown on page 63. These effects are very easily produced and the making of such prints is quite practical in schools where printing from *engraved* color blocks is not feasible. They represent but a step beyond the simple tint-block method described on page 53. Indeed, the blocks are prepared in the same way and the skill needed to graduate the colors on the tint-block is soon acquired.

The following exercises, illustrated on page 61, are suggested. Charge the brayer with any desired color and roll it across the top of a tint-block (Fig. 1). Use a small block for this experiment. Without re-charging the brayer roll it across the block again, lower down as in Fig. 2, and again as in Fig. 3. Keep going down the block as far as the ink holds out. The result will be somewhat like that shown in Fig. 4, the gradation being effected by a series of steps. By practice this may be overcome and a smooth transition like Fig. 5 easily produced. A more abrupt gradation is secured by starting with the roller in the position shown in Fig. 6. This concentrates the color at the top of the block.

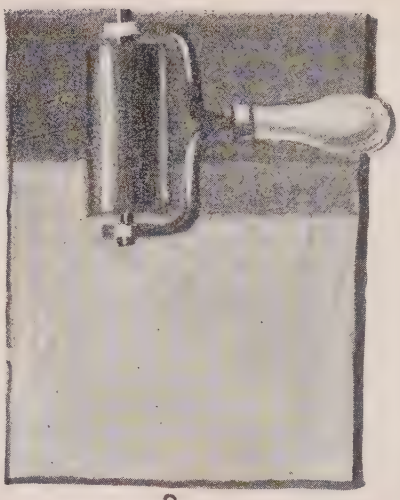
The blue tint of the "Moonlit Forest" (page 63) was applied as demonstrated on page 61. In the "Corn Field" the orange was rolled up from the bottom, just as the blue was graduated from the top. The marine subject is a bit more complicated. First the blue was rolled down from the top; next the green was applied at the bottom. Then the blue was rolled on the bottom, right on top of the green pigment and blending with it, producing the blue green. For such blending of colors the consistency of the inks must be well planned. The ink first rolled on the block should be rather heavy or sticky. The color to go over it must be thinner (more oily), so that it will stick to the first heavy color. Yet if there be too much contrast in the consistency of the pigments the blending will be poor. Experiments will teach the proper adjustment.

It is imperative to use an absorbent paper in printing. In gradations the color is piled up quite heavily in places and an absorbent paper is necessary in order to "drink" all of this pigment from the block.

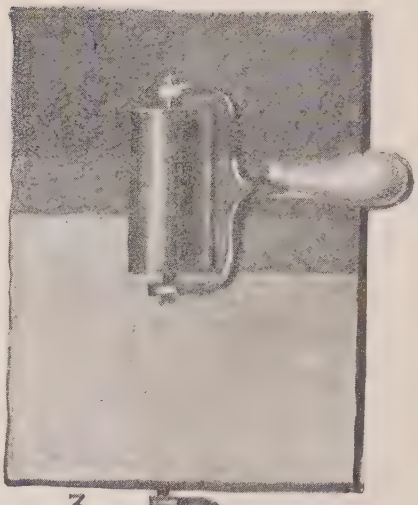
COLOR GRADATIONS AND BLENDINGS



1

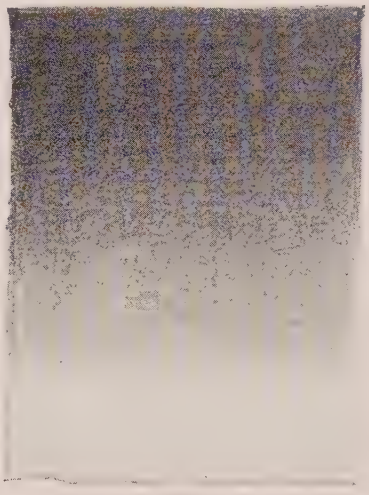


2



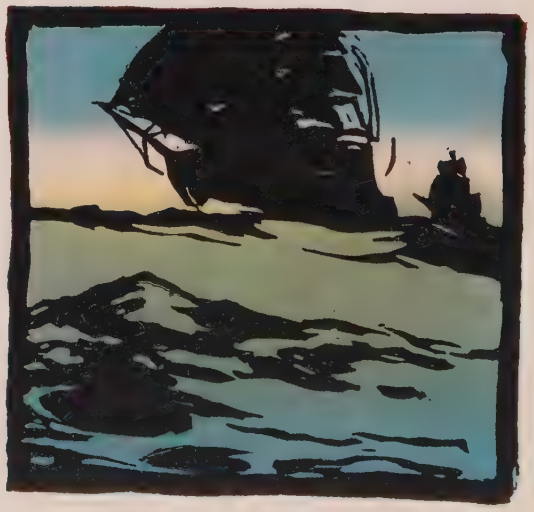
3

4



5

6



CHAPTER XVI

BLOCK PAINTING

IF an oil painting is made upon a smooth sheet of copper, zinc, or any other metal, a print can be made by laying a piece of paper down on the painting and putting it in the press. This operation transfers the paint from the metal to the paper and produces what is known as a "monotype." It is so-called because but one impression can be taken from a plate or block thus prepared. To produce another print, the whole process must be repeated, including the painting of the picture. As a matter of fact the monotype picture is not made in duplicate, nor is there any practical reason for doing so. Transferring a painting to a sheet of paper is merely done to secure a certain charm of technique which is peculiar to the monotype and which can be secured by no other means.

The practical way to print colored pictures in duplicate is to prepare a series of blocks, each one so carved that it will be responsible for a given color in the original. When these blocks have been made ready and the colors mixed, one color for each block, the production of any number of duplicates would appear to be a mechanical matter. And so it is if the print maker be content to apply his colors mechanically to the blocks. Many artists are in fact satisfied to do this, believing that printing is a mechanical operation and that his *creative* work should be confined to composition, color scheme and cutting the blocks; that these should be so designed as to demand nothing more than good craftsmanship in printing. Others insist upon painting upon certain of their blocks and thus borrow the technique of the monotype artist to supplement their own.

"Block painting" is the term sometimes applied to prints which thus go beyond the possibilities of flat inking, and which are produced by painting several colors on one or more of the blocks. The chapter on Color Gradations and Blendings describes how this can be done. Although this demonstration deals with only the simplest effects, the student can readily understand how the principle can be applied in a more complicated technique. The print "Wings of Glory" on page 67, with its color proofs, is a good example to show in this connection as it relies so much upon the free painting which appears on several blocks.

There are those who complain that such effects should not appear in block prints; that the block printer is "straining" his medium when

he attempts to give a print the properties of a painting. Such critics probably object to etchings in which "wiping" of the plates gives them important qualities. They maintain that the etched lines of the design constitute the etching and assert that light and dark effects secured by tricky wiping are illegitimate. Indeed, any etching which subordinates the etched line to a wiped effect is in popular disfavor. Similarly it is quite possible to depend too much upon free inking or painting on linoleum blocks and thus to lose the block print character. After all, the block print should be chiefly admired for its "design" and direct expression. Painting upon the blocks ought to be done with considerable reserve.

Japanese Prints furnish us with both a defense of block painting and an example of the restraint with which it should be practiced. That the Japanese artists should have painted upon their blocks—they used brushes and water colors—in imitation of paintings of the artists of their time was very natural. They of course realized the futility of attempting to make prints look *exactly* like these paintings, yet they discovered that *some* effects of the painting could readily be secured by a little painting here and there on their blocks.

At any rate the Japanese artist handled his brush with considerable freedom and his printing was *creative* rather than mechanical. Imagine trying to take impressions from Japanese color blocks on a power press! And what the Japanese artist did with brushes, the linoleum printer can approximate with his rollers in so far as general effect is concerned.

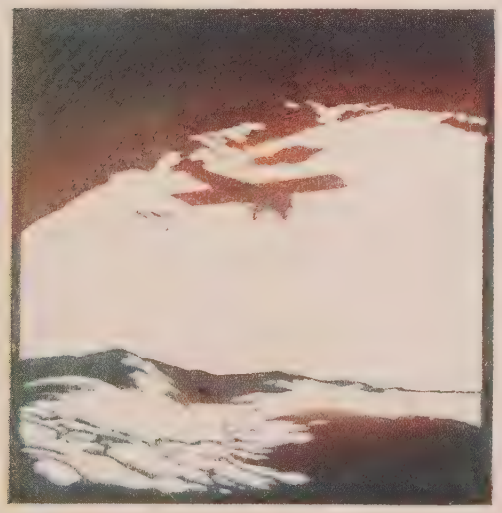
Process proofs of **"WINGS OF GLORY"** by Ernest W. Watson.

1. A tint block depositing yellow as an undertone over entire block.

2. Orange with gradations.

3. How different colors are "painted" on the block is shown here where three colors are applied with gradations and blendings.

4. The red of the sky and sea was first applied; then a violet blue rolled over top of sky; last, the deep blue was "painted" over the sea.



5. Red applied first; the blue rolled on top of red as shown.

6. The finished print, made by printing 1, 2, 3, 4 and 5 in the order of the numbering.

Original print is 9½ x 10 inches.

CHAPTER XVII

THE TECHNIQUE OF BLOCK PRINTING

A SOFT absorbent paper gives the best results in printing from linoleum blocks. An imprint made upon a hard surfaced paper will show ridges or walls of ink surrounding the areas of color. When the inked block is pressed against the paper, the ink must go somewhere. If the paper is absorbent the color sinks into its surface; if non-absorbent, the pigment oozes out between the two hard surfaces of block and paper.

Soft white printing paper, made by hand in Japan, is distributed in America by The Japan Paper Company. It is a delightful printing paper and there is none better for making fine color prints. Ordinary white blotting paper is an admirable substitute for school use. Indeed, blotting paper is ideal for experimental work. It is stiff and easily handled, while the Japanese paper requires the most considerate treatment. There are good papers for printing to be found among the colored papers furnished by school supply companies. Where strict economy must be practiced, unprinted newspaper will do for "single pull" prints. Almost any semi-absorbent paper will answer for single impressions and for offsets, but for color printing where several colors are applied without waiting for drying between successive imprints, either Japanese paper or some other very absorbent paper must be used.

Receptivity of the paper is indeed one of the essential conditions for fine color printing. This quality accounts for soft edges and for the "blending" of the various colors which really amounts to their mixing after being applied to the paper. The method of printing successive colors while the undercolors are still wet is contrary to the practice of the commercial print shop where the first color is permitted to dry before another is added, and the results are as unlike as the methods employed. Print red over yellow after the yellow has dried; the yellow modifies the red merely because the red is not quite opaque and the yellow is seen through it. Print the red over the yellow while wet and the red is more strongly influenced by the undercolor, and in a different way; the two colors actually combine and produce a third color. The importance of this distinction is not apparent until experiments are made and the infinite possibilities inherent in wet overlays are thus convincingly demonstrated.

The fact that absorbent paper permits the artist to complete a four or fourteen-color print without delay is of much importance.

Imagine the impatience of the artist who is experimenting with color schemes if forced to wait twenty-four hours before trying another color. The artist cannot print in a mechanical way; he must develop his print as he would an oil painting, trying this color, then that, with a medium which is flexible and freely manipulated. Even after the color scheme of the print has been developed he demands that same flexibility in the production of the succeeding prints of the edition, each print being slightly different and the result of continuous creative effort rather than of a mechanically organized system of printing.

The paper must be cut large enough to allow for the use of the finder as described in Chapter XIII. It should be centered upon the printing mat of the press bed. A piece of semi-absorbent paper, or even blotting paper, should first be laid down on the mat to protect it from color which penetrates to the back of the print. Keeping the printing mat clean is not the chief function of the "undersheet." The absorbent undersheet relieves the print of excess color which is driven through it while under the press. In making a print from several blocks the undersheet will thus absorb enough pigment to clearly show the forms and colors of the design.

The method of rolling up the ink or paint preparatory to applying it to the block is described in Chapter IV. A certain amount of experimentation will teach the student how thick the ink should be and how heavy a film should be rolled up. Upon examination through a magnifying glass the ink film upon the slab will be seen to be made up of innumerable globules of pigment. The ink films on the brayer and on the linoleum block present the same physical appearance. Of course these globules will likewise appear on the print. The stiffer the ink and the thicker the film, the larger are these ink particles. They can often be seen without a glass. In fact much of the charm of the linoleum print is due to this very condition of the ink; edges are softer and an atmospheric effect results. In color printing, a globular film printed over another hue gives a vibrating color effect, the under hue showing pure between the particles of the overlaid film. If the ink is sufficiently thinned with linseed oil, the globules are reduced in size and they will not be seen in the print.

Ink consistency is thus an essential factor in the technique of the block print. Not only is the general consistency of the inks on the slab of much importance: their *relative* consistency must be right. When one

WOODCUT "SAMSON AND THE LION" by ALBRECHT DURER.
Original cut is 11 x 15½ inches.
Reproduced by courtesy of The Metropolitan Museum of Art.

color is to be printed over another, the first pigment must be stiffer than the second. When it is realized that stiff color is "sticky" the reason for this is clear. The first color must be stickier than the second or it will not receive the second color from the block. Thus, when making a print involving several colors, each succeeding color must be slightly thinner than its predecessor.

In inking the block, the brayer is rolled over the relief areas lightly, avoiding too much pressure, which may force the soft cylinder down into the background depressions. Blocks with large printing areas are more easily inked than those possessing small and widely spaced lines or masses. The brayer *rolls* over the block because of the *friction* between block and brayer. When the relief areas are slight there is less friction and the brayer tends to *slide* rather than roll, resulting in the piling up of pigment against the walls of the engraving, and scanty ink deposits on the printing surfaces. "Drag" is the technical term describing this unwelcome condition. The student engraver soon learns to design his blocks with due respect for this tendency.

After making a few imprints, the blocks should be washed with a cloth dampened with benzine. Dry with another cloth if the block is to be inked immediately. A block moist with benzine repels the ink. Some printing conditions dictate the cleansing of the block after each imprint but ordinarily many imprints can be made without cleansing.

In color printing, the brayers are in constant need of cleaning. This may be accomplished by washing them with a cloth moistened with benzine. A quicker method is to roll the color off on the pages of a discarded magazine. Lay the magazine on the end of the print table or elsewhere within easy reach. After a page has been ink-coated turn the next page, going through the book in this manner. This seems like a trifling detail but the author has found it quite otherwise. When cleaning the rollers on loose sheets these papers require handling. They are also likely to blow about the room and cause disorder.

When the ink films rolled out on the slab become impure or filled with little particles of grit or linoleum chip, scrape up with a palette knife and spread out a fresh film. These ink films also become dry and "tacky" after long exposure to the air and should then be scraped off and discarded.

CHRISTMAS CARD by JOHN C. JOHANSEN.
Reduced from the original, which is 7 x 4½ inches.

The original was printed in a grayed red ink upon a cream handmade Japanese paper. It is practically designed for a block print and is rendered with the exquisite drawing which characterizes the brilliant painting of this well-known American artist.

In composing a picture, the painter arranges the masses so they will be effective in design and thus give pleasure through the beauty of their relationships. The block print artist has the same problem of course, but his design should be something more than pleasing; it must be practical for printing. In a well-designed block the printing areas are planned so as to insure good inking and proper distribution of pressure when in the press. It is evident that the splendid block, on the page opposite, by Doloris Lynch was designed with a thorough appreciation of these practical requirements.

A WELL-DESIGNED LINOLEUM BLOCK by DOLORIS LYNCH.
Exact size of original.

THE MASTER'S COLLEGE
761.3 W332L
Watson, Ernest Will/Linoleum block print
3 3540 00006 0348